NATIONAL MARINE FISHERIES SERVICE REPORT

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

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

Council Task:

Discussion.

Reference Materials:

1. Agenda Item F.1.a, Attachment 1: *Federal Register* Notices Published Since the Last Council Meeting.

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
05/21/08

Agenda Item F.1.a
Attachment 1
June 2008

FEDERAL REGISTER NOTICES

Groundfish and Halibut Notices
March 29 through May 30, 2008

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

73 FR 19050. Pacific Coast Groundfish Fishery; Application for an Exempted Fishing Permit (EFP). NMFS announces the receipt of two Exempted Fishing Permit applications participating in the EFP fisheries - 4/8/08

73 FR 21057. Pacific Coast Groundfish Fishery; Biennial Specifications and Management Measures; Inseason Adjustments. This final rule announces inseason changes to management measures in the commercial and recreational fisheries - 4/18/08

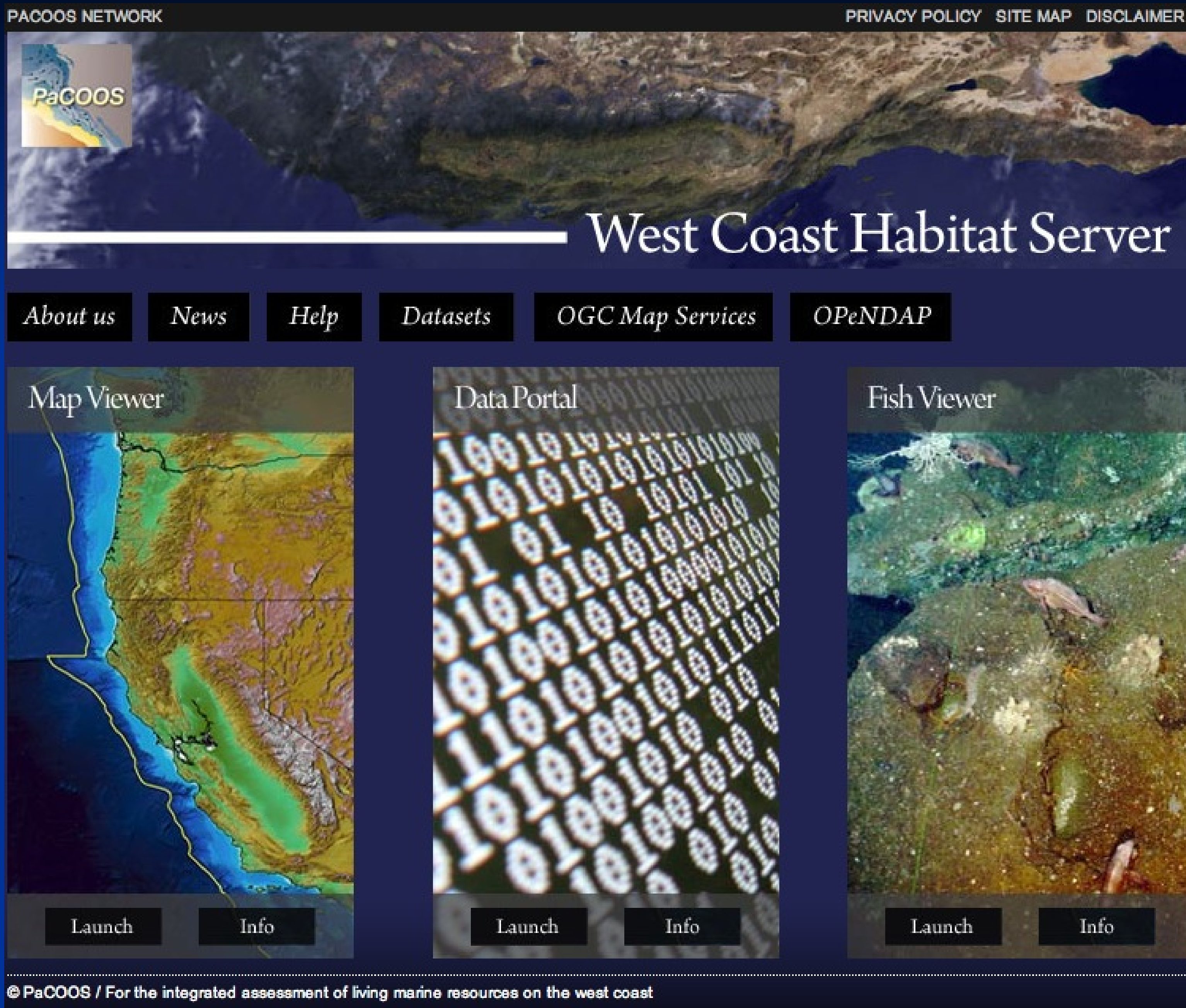
73 FR 26325. Pacific Coast Groundfish Fishery; Biennial Specifications and Management Measures - This final rule establishes the 2008 fishery specifications for Pacific Whiting in state waters off Washington, Oregon, and California - 5/9/08

Agenda Item F.1.b
Supplemental Science Center Activities PowerPoint
June 2008

National Marine Fisheries Service

F.1.b Science Center Activities

Dr. Elizabeth Clarke
Dr. James Hastie


PACOOS NETWORK
PRIVACY POLICY
SITE MAP
DISCLAIMER
PaCOOS
West Coast Habitat Server
About us
News
Help
Datasets
OGC Map Services
OPeNDAP
Map Viewer
Launch
Info
Data Portal
Launch
Info
Fish Viewer
Launch
Info
© PaCOOS / For the integrated assessment of living marine resources on the west coast

Some of the information…

- Bathymetry
- Management Areas
- Habitat Maps
- OR/WA Tectonic Structure
- Seafloor Sample Locations
- Ocean Climatologies
- Coastwide ADCP
- Groundfish Survey
- Cold Water Coral
- Kelp Distributions
- Fish Habitat Utilization Data
- Fishery Observer Information

PaCOOS: West Coast Habitat Portal
for the integrated assessment of living marine resources on the west coast
Oregon State University
OSU
Layer Query
KMZ
Meta Data
Get Data
Print
Contribute!
Help
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Auto Update?
Update Map
Closed Fishing Areas
Data Index Layers
Buoys
Fish and Invertebrate Data
Kelp Data (zoom close to the coast!)
Geological Data
Habitat Maps
Surficial Geologic Habitat OR-WA
EFH EIS Surficial Geologic Habitat WA
EFH EIS Surficial Geologic Habitat OR
EFH EIS Surficial Geologic Habitat CA
Greater than 10 degree slope
SGH 43 Fathom Bank
SGH Cherry Bank
SGH Osborn Bank
SGH Pilgrim-Kidney Bank
SGH Potato Bank
OR/WA Tectonic Structure
Sidescan Sonar Imagery
Seafloor Samples
Tsunami Inundation
Submersible Cruises
Oceanographic Data
Oregon Territorial Sea Data
Remote Databases (for query only)
NOAA Habitat Use Database
Testing
Southwest Center
14-day SST
2007-01
Query Layers
Allow Multiple?
NOAA Habitat Use Database
Table of Contents Usage
-> Left click ToC layer for meta data
-> Right click ToC layer for legend
Select visible layers
+? Select feature layer for queries
We will query the area in blue
0 11km

Spatial Query - Windows Internet Explorer
http://pacoos.coas.oregonstate.edu/MarineHabitatViewer/Query.aspx?SpatialEnvelope=-124.65704404525726,45.825694138253475,-12
SnagIt
Spatial Query
Latitude 45.82570 <=> 46.01387 Longitude -124.65700 <=> -124.4
Avg Depth 164.07 Min Depth 122 Max Depth 207 Depth S.D. 13.66 Data Coverage
NOAA Habitat Use Database
Groundfish predicted to live in this habitat
select Sablefish
Sablefish (Anoplopoma fimbria)
Arrowtooth Flounder (Atheresthes stomias)
Pacific Sanddab (Citharichthys sordidus)
Petrale Sole (Eopsetta jordani)
Pacific Cod (Gadus macrocephalus)
Rex Sole (Glyptocephalus zachirus)
Flathead Sole (Hippoglossoides elassodon)
Spotted Ratfish (Hydrolagus colliei)
Butter Sole (Isopsetta isolepis)
Rock Sole (Lepidopsetta bilineata)
Dover Sole (Microstomus pacificus)
Lingcod (Ophiodon elongatus)
English Sole (Parophrys vetulus)
Starry Flounder (Platichthys stellatus)
Big Skate (Raja binoculata)
California Skate (Raja inornata)
Rougheye Rockfish (Sebastes aleutianus)
Pacific Ocean Perch (Sebastes alutus)
Redbanded Rockfish (Sebastes babcocki)
Silvergray Rockfish (Sebastes brevispinis)
Darkblotched Rockfish (Sebastes crameri)
Splitnose Rockfish (Sebastes diploproa)
Greenstriped Rockfish (Sebastes elongatus)
Widow Rockfish (Sebastes entomelas)
Export to Excel
Refresh Chart

Fish Viewer

FishData - Windows Internet Explorer

http://webapps.nwfsc.noaa.gov/pacoos/faces/FishData.jsp;jsessionid=a137d4c722b8e76d5ce707fe4687b5b2b84eff54af9a

Choose Fish	Sablefish	Common Name	Sablefish	Download Data
		Scientific Name	*Anoplopoma fimbria*	

Select Download Data

Picture Credit

NOAA NMFS NWFSC FRAM

Eggs

	Absolute	Preferred
Min. Latitude	28.0	
Max. Latitude	55.0	
Min. Depth (m)	0	300
Max. Depth (m)	1900	1200
Min. Temp		
Max. Temp		

Larvae

	Absolute	Preferred
Min. Latitude	28.0	
Max. Latitude	55.0	
Min. Depth (m)	0	
Max. Depth (m)	1200	
Min.Temp		
Max. Temp		

Juveniles

	Absolute	Preferred
Min. Latitude	28.0	
Max. Latitude	55.0	
Min. Depth (m)	0	
Max. Depth (m)	1200	
Min. Temp		
Max. Temp		

Adults

	Absolute	Preferred
Min. Latitude	28.0	
Max. Latitude	55.0	
Min. Depth (m)	0	200
Max. Depth (m)	1900	1200
Min. Temp		
Max. Temp		

DataDownload - Windows Internet Explorer

http://webapps.nwfsc.noaa.gov/pacoos/faces/DataDownload.jsp

Download Data

Download as OPeNDAP Binary Object	Download as OPeNDAP ASCII Text object
Coral 1980-2005	Coral 1980-2005
Groundfish Survey 2003-2006	Groundfish Survey 2003-2006
HUD Fish Occurrence Details	HUD Fish Occurrence Details
HUD Fish Species Details	HUD Fish Species Details
HUD Predators and Prey	HUD Predators and Prey
HUD References	HUD References
Observer Fixed Gear 2002-2006	Observer Fixed Gear 2002-2006
Observer Trawl 2002-2006	Observer Trawl 2002-2006

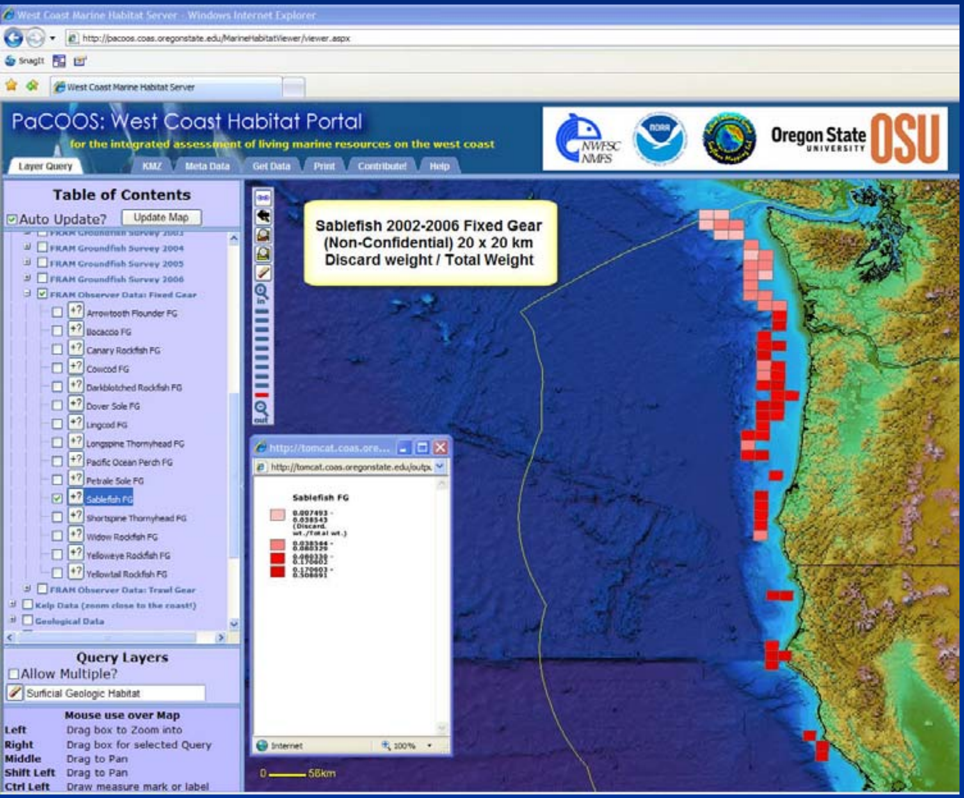
You can download the data in any of the four formats

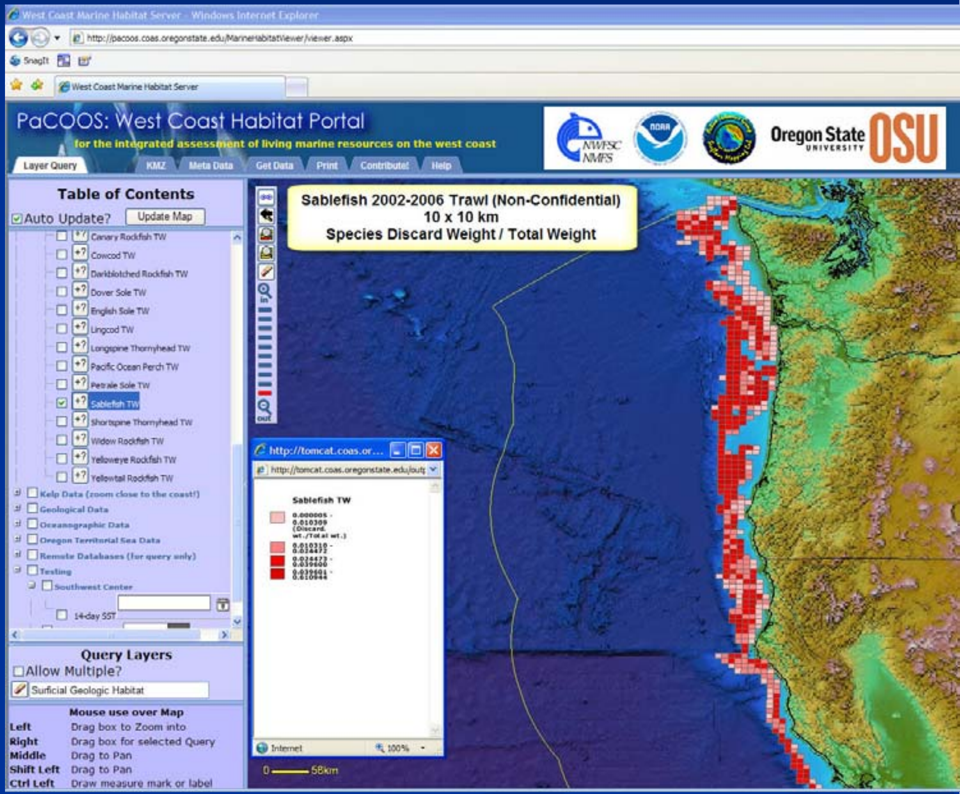
Download as Excel (CSV) Files	Download as Adobe PDF Files
Coral 1980-2005	Coral 1980-2005
Groundfish Survey 2003-2006	Groundfish Survey 2003-2006
HUD Fish Occurrence Details	HUD Fish Occurrence Details
HUD Fish Species Details	HUD Fish Species Details
HUD Predators and Prey	HUD Predators and Prey
HUD References	HUD References
Observer Fixed Gear 2002-2006	Observer Fixed Gear 2002-2006
Observer Trawl 2002-2006	Observer Trawl 2002-2006

New Groundfish Data

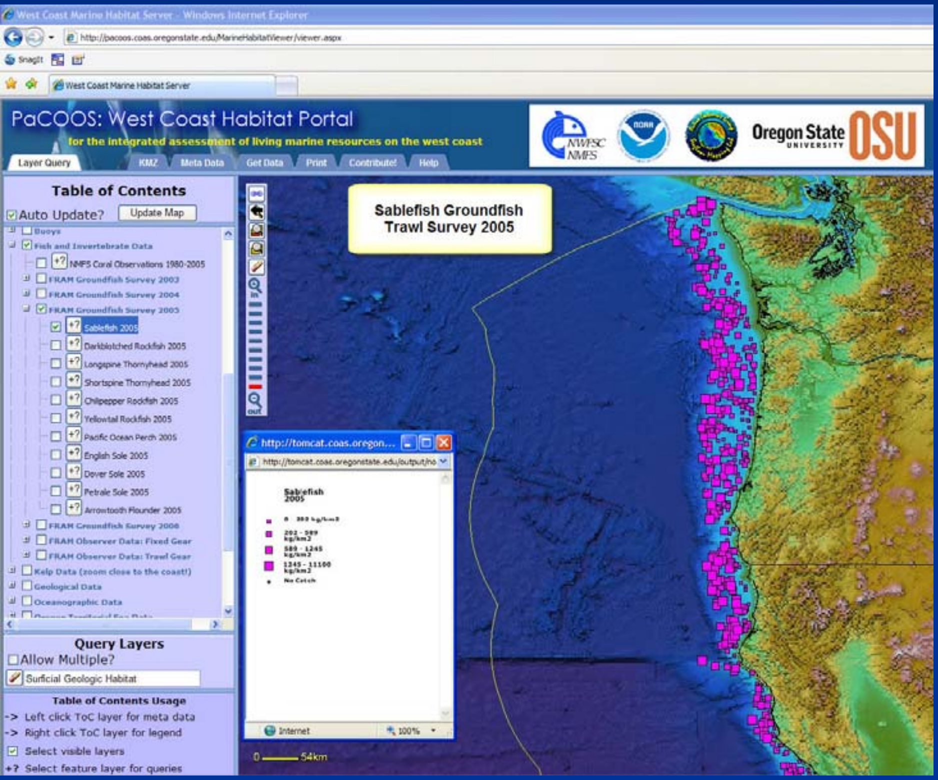
- Observer Fixed Gear 2002-2006 (20 x 20 km)
- Observer Trawl 2002-2006 (10x10 km)
- Groundfish Trawl 2003-2006

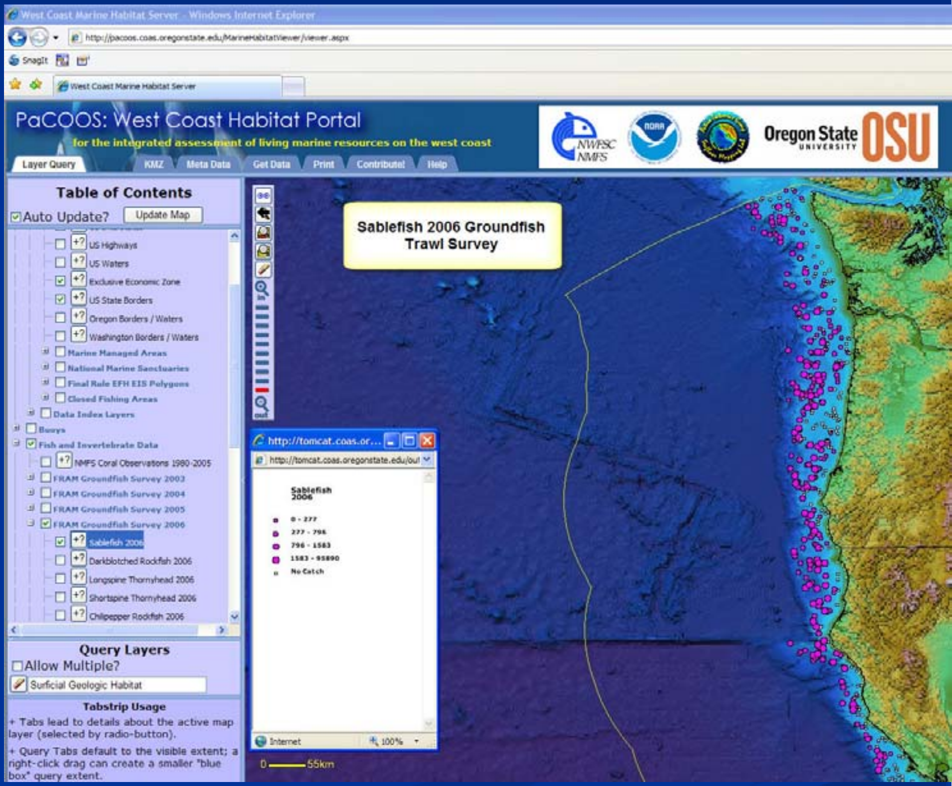
West Coast Groundfish Observer Data – New!





Groundfish Trawl Data – 2005 & 2006 New!





Agenda Item F.2
Situation Summary
June 2008

STOCK ASSESSMENT PLANNING FOR 2011-2012 GROUNDFISH FISHERY DECISION MAKING

In March, the Council adopted for public review a preliminary list of groundfish stocks to be assessed next year (Agenda Item F.2.a, Attachment 1), which will be used to decide the harvest specifications and management measures for 2011 and 2012 groundfish fisheries. There are currently eight full assessments preliminarily planned to be conducted in the next cycle and, with five stock assessment review (STAR) panels scheduled and a recommended limit of two full assessments reviewed at each STAR panel, there may be capacity to add two full assessments. The Council initially considered new assessments for the minor rockfish complexes and for species where data are particularly sparse. The Scientific and Statistical Committee (SSC) noted that new methods for assessing data-poor species and species complexes may need to be developed. Therefore, the Council recommended that the SSC and other scientists develop these methods, as well as review protocols, so that new types of assessments for data-poor species and species complexes can be considered in 2011 to inform management decisions for 2013 and 2014 fisheries. Dr. Elizabeth Clarke will discuss the National Marine Fisheries Service (NMFS) perspective on the list of stock assessments in Agenda Item F.2.b, Attachment 1.

The Council also adopted for public review a draft terms of reference for the groundfish stock assessment and review process for 2009-2010 as recommended by the SSC, with the deletion of one paragraph regarding the number of STAR panel reviewers shown in strikethrough (Agenda Item F.2.a, Attachment 2). Since March, members of the SSC and the Northwest Fisheries Science Center reviewed this terms of reference and offer their recommendations in Attachment 1 (suggested additions are underscored and deletions are in a strikethrough format).

A draft terms of reference for groundfish rebuilding analysis was also adopted in March. Members of the SSC have worked on updating this terms of reference since the March meeting to more accurately reflect the types of rebuilding analyses required since consideration of Amendment 16-4 rebuilding plans (Agenda Item F.2.a, Attachment 3).

The Council is tasked at this meeting with final adoption of a list of groundfish stocks to be assessed next year, including full and updated assessments; providing guidance on a schedule of STAR panels to review new full assessments (the SSC will review updated assessments); final adoption of a Stock Assessment and Review Process Terms of Reference for 2009-2010; and final adoption of a Groundfish Rebuilding Analysis Terms of Reference. The Council should consider advice from the NMFS science centers, advisory bodies, and the public before making these decisions.

Council Action:

1. **Adopt a Final List of Stocks To Be Assessed in 2009.**
2. **Provide Guidance on a Final 2009 Stock Assessment Review Schedule.**
3. **Adopt a Final Terms of Reference for the Groundfish Stock Assessment and Review Process for 2009-2010.**
4. **Adopt a Final Terms of Reference for Groundfish Rebuilding Analysis.**

Reference Materials:

1. Agenda Item F.2.a, Attachment 1: Table 1. Council Proposed Schedule for West Coast Groundfish Assessments in 2009.
2. Agenda Item F.2.a, Attachment 2: Draft Terms of Reference for the Groundfish Stock Assessment and Review Process for 2009-2010.
3. Agenda Item F.2.a, Attachment 3: Draft SSC Terms of Reference for Groundfish Rebuilding Analysis.

Agenda Order:

a. Agenda Item Overview	John DeVore
b. Stock Assessment Options	Elizabeth Clarke
c. Scientific and Statistical Committee Report	Steve Ralston
d. Reports and Comments of Advisory Bodies	
e. Public Comment	
f. **Council Action:** Adopt Final Terms of Reference, Stock Assessments, and Assessment Schedule for 2009	

PFMC
05/27/08

Agenda Item F.2.a
Attachment 1
June 2008

Table 1. Council proposed schedule for west coast groundfish assessments in 2009 and beyond.
(This list was released for public review after the March, 2008 Council Meeting; subsequent NMFS comments are shownin right column)

	Species	Last Full Assmt		2009 Full	2009 Update	2009 Possible Lead	2011 Full	2011 Upd.	2013 Full	2013 Upd.	*NMFS Comments*
	P. hake (Whiting)	2008	SS2	X		NW	X		X		US-Can. treaty process in 2009?
Shelf	Bocaccio rockfish	2003	SS1	X		SW		X		X	
	Canary rockfish	2007	SS2		X	NW	X			X	
	Chilipepper rockfish	2007	SS2						X		
	Cowcod	2007	SS2		X	SW	X			X	
	Widow rockfish	2005	ADMB	X		SW		X		?	
	Yelloweye rockfish	2006	SS2	X		NW		X		X	
	Yellowtail rockfish	2000	ADMB				X				
	Lingcod #	2005	SS2		X	NW					*New data available; NWC rec. full asmnt.*
	Arrowtooth	2007	SS2						X		
	English sole	2007	SS2					X			
	Petrale sole	2005	SS2	X		NW/ODFW?				X	
	Longnose skate	2007	SS2								
Slope	Pacific ocean perch #	2003	ADMB		X	NW		X		X	*NWC would prefer full*
	Darkblotched rockfish	2007	SS2		X	NW		X	?	?	
	Blackgill rockfish	2005	SS2				X				
	Bank rockfish	2000	SS1			NW					*NWC rec. data report or full assessment*
	Shortspine thornyhead	2005	SS2				X				
	Longspine thornyhead	2005	SS2				X				
	Sablefish	2007	SS2				X				
	Dover sole	2005	SS2				X			X	
Nearshore	Black rockfish	2007	SS1					X			
	Cabezon	2005	SS2	X		NW + CDFG					
	Cal. Scorpionfish	2005	SS2					?	?	?	
	Gopher rockfish	2005	SS2				X				
	Blue rockfish	2007	SS2					?	?		
	Kelp greenling	2005	SS2				?	?			
	Starry flounder	2005	SS2					X			
Currently Unassessed											
	Spiny Dogfish			X		WA					
	Minor Slope Complex	To address need for science-based ACLs		Develop methods and protocols of analysis and evaluation in next off-year (2010)			X	NW +			
	Minor Shelf Complex						X	NW +			
	Minor Nearshore Complex						X	SW +			
	Bronzespotted rockfish			*		SW					
	Greenspotted rockfish			*		SW					
	Splitnose #	1994	data report			NW					*Good data availability; NWC rec. full*
	Greenstriped rockfish #					NW					*Good data availability; NWC rec. full*

* May take the form of data reports rather than full assessments

\+ Will require collaboration among assessment groups

\# If reviews of the status of minor complexes are not conducted during 2009, then some other species should be elevated to full assessments, in order to balance workload across 2009-11. The Northwest Center suggests full assessments be considered for POP, lingcod, and splitnose and greenstriped rockfishes.

Also during 2009, work will focus on developing ageing methodologies and growth curves for assessments of sandabs, rex sole, grenadiers for ACLs

GROUNDFISH STOCK ASSESSMENT AND REVIEW PROCESS FOR 2009-2010

Introduction

The purpose of this document is to convey expectations and responsibilities for various participants in the groundfish stock assessment review process (STAR), and~~is~~ to help the Council family and others understand ~~the groundfish stock assessment review process (STAR)~~ the process. Parties involved are the National Marine Fisheries Service (NMFS); state agencies; the Council and its advisors, including the Scientific and Statistical Committee (SSC), the Groundfish Management Team (GMT), the Groundfish Advisory Subpanel (GAP), Council staff; and interested persons. The STAR process is a key element in an overall process designed to make timely use of new fishery and survey data, to analyze and understand these data as completely as possible, to provide opportunity for public comment, and to assure that the results are as accurate and error-free as possible. The STAR process is designed to assist in balancing these somewhat conflicting goals of timeliness, completeness and openness.

These Terms of Reference are intended as guidelines for the preparation and review of groundfish stock assessments developed for the Pacific Fishery Management Council. This current edition reflects many recommendations from previous participants in the STAR process, including STAR panel members, SSC members, STAT Teams, Council staff, and Council advisory groups. Nevertheless, no set of guidelines can be expected to deal with every contingency, and all participants should anticipate the need to be flexible and to address new issues as they arise.

In this document, the term "stock assessment" includes activities, analyses and reports, beginning with data collection and continuing through to scientific recommendations and information presented to the Council and its advisors. Stock assessments provide the fundamental basis for management decisions on groundfish harvests. To best serve that purpose, stock assessments should attempt to identify and quantify major uncertainties, balance realism and parsimony, and make best use of the available data.

STAR Goals and Objectives

The goals and objectives for the groundfish assessment~~[1]~~ and review process are to:

a) Ensure that groundfish stock assessments provide the kinds and quality of information required by all members of the Council family.

b) Satisfy the Magnuson-Stevens Sustainable Fisheries Act (SFA) and other legal requirements.

c) Provide a well-defined, Council-oriented process that ~~helps make~~ensures groundfish stock assessments are the "best available" scientific information, and facilitates use of the information by the Council. In this context, "well-defined" means with a detailed calendar, explicit responsibilities for all participants, and specified outcomes and reports.

d) ~~Emphasize~~ Provide an~~external,~~ independent external review of groundfish stock assessment work.

e) Increase understanding and acceptance of groundfish stock assessment and review work by all members of the Council family.

f) Identify research needed to improve assessments, reviews, and fishery management in the future.

g) Use assessment and review resources effectively and efficiently.

Shared Responsibilities

All parties have a stake in assuring adequate technical review of stock assessments. NMFS must determine that the best scientific advice has been used when it approves fishery management recommendations made by the Council. The Council uses advice from the SSC to determine whether the information on which it will base its recommendation is the "best available" scientific advice. Fishery managers and scientists providing technical documents to the Council for use in management need to assure that the work is technically correct. Program reviews, in-depth external reviews, and peer-reviewed scientific publications are used by federal and state agencies

[1] In this document, the term "stock assessment" includes activities, analyses, and management recommendations, beginning with data collection and continuing through to the development of management recommendations by the Groundfish Management Team and information presented to the Council as a basis for management decisions.

to provide quality assurance for the basic scientific methods used to produce stock assessments. However, the time-frame for this sort of review is not suited to the routine examination of assessments that are, generally, the primary basis for a harvest recommendation.

The review of current stock assessments requires a routine, dedicated effort that simultaneously meets the needs of NMFS, the Council, and others. Leadership, in the context of the stock assessment review process for groundfish, means consulting with all interested parties to plan, prepare terms of reference, and develop a calendar of events and a list of deliverables. Coordination means organizing and carrying out review meetings, distributing documents in a timely fashion, and making sure that assessments and reviews are completed according to plan. Leadership and coordination involve costs, both monetary and time, which have not been calculated, but are likely substantial.

The Council and NMFS share primary responsibility to create and foster a successful STAR process. The Council will sponsor the process and involve its standing advisory committees, especially the Scientific and Statistical Committee. NMFS will provide a coordinator to oversee and facilitate the process. Together they will consult with all interested parties to plan, prepare terms of reference, and develop a calendar of events and a list of deliverables. NMFS and the Council will share fiscal and logistical responsibilities.

The STAR process is sponsored by the Council because the Federal Advisory Committee Act (FACA) limits the ability of NMFS to establish advisory committees. FACA specifies a procedure for convening advisory committees that provide consensus recommendations to the federal government. The intent of FACA was to limit the number of advisory committees, ensure that advisory committees fairly represent affected parties, and ensure that advisory committee meetings, discussions, and reports are carried out and prepared in full public view. Under FACA, advisory committees must be chartered by the Department of Commerce through a rather cumbersome process. However, the SFA exempts the Council from FACA *per se*, but requires public notice and open meetings similar to those under FACA.

NMFS Responsibilities

NMFS will work with the Council, other agencies, groups, or interested persons that carry out assessment work to organize Stock Assessment Teams (STAT) and STAR Panels~~, and make sure that work is carried out in a timely fashion according to the calendar and terms of reference~~. NMFS will provide a Stock Assessment Coordinator to organize these tasks with assistance from Council staff. To initiate the assessment cycle, NMFS will convene workshops to provide opportunities for assessment scientists and interested parties (e.g., the GMT) to discuss important topics relating to upcoming stock assessments. To promote consistency, representatives from each STAT team are expected to attend these workshops.

The SSC will appoint STAR Panel chairs from among its membership. The NMFS Stock Assessment Coordinator will identify and select other STAR panelists following criteria for reviewer qualifications developed in consultation with the SSC. The public is welcome to nominate qualified reviewers. Selection of STAR panelists should aim for balance between outside expertise and in-depth knowledge of West Coast fisheries, data sets available for those fisheries, and modeling approaches applied to West Coast groundfish species. The ~~bulk~~ majority of panelists should be experienced stock assessment scientists, i.e., individuals who have done ~~actual~~ stock assessments using current methods. Panelists should be knowledgeable about the specific modeling approaches being reviewed, which in most cases will be statistical age- and/or length-structured assessment models. It is recognized that the pool of qualified reviewers is limited, and that staffing of STAR panels is subject to constraints that may make it difficult to achieve these objectives.

Following any modifications to the stock assessments resulting from STAR panel reviews and prior to SSC review, the Stock Assessment Coordinator will review the Executive Summary for consistency with the Terms of Reference. Inconsistencies will be identified and the authors requested to make appropriate revisions in time for the appropriate SSC and GMT meetings, when an assessment is considered.

Individuals (employed by NMFS, state agencies, or other entities) who conduct groundfish stock assessments or associated technical work are responsible for ensuring that their work is technically sound and complete. Stock assessments must be completed and reviewed in full accordance with the Terms of Reference (Appendices B and C) at the times specified in the calendar (Appendix A).

STAT Team Responsibilities

The STAT is responsible for conducting a complete and technically sound stock assessment that conforms to accepted standards of quality, and make sure that work is carried out in a timely fashion according to the calendar and terms of reference. The STAT will conduct its work and activities in accordance with the Terms of Reference for Groundfish STAT Teams. The final product of the STAT will be a stock assessment document that follows the outline specified in Appendix B.

GMT Responsibilities

The GMT is responsible for identifying and evaluating potential management actions based on the best available scientific information. In particular, the GMT makes ABC and OY recommendations to the Council based on estimated stock status, uncertainty about stock status, and socioeconomic and ecological factors. The GMT will use stock assessments, STAR Panel reports, and other information in making their recommendations. The GMT's preliminary ABC recommendation will be developed at a meeting that includes representatives from the SSC, STAT Teams, STAR Panels, and GAP. A GMT representative(s) will be appointed by the chair of the GMT to track each stock assessment, and will serve as advisor to the STAT Team and STAR Panel. The GMT representative will participate in review discussions, but will not serve as a member of the Panel. The GMT representative should be prepared to advise the STAT Team and STAR Panel on changes in fishing regulations that may influence data used in the assessment and the nature of the fishery in the future.

The GMT will not seek revision or additional review of the stock assessments after they have been reviewed by the STAR Panel. The GMT chair will communicate any unresolved issues to the SSC for consideration. Successful separation of scientific (i.e., STAT Team and STAR Panels) from management (i.e., GMT) work depends on stock assessment documents and STAR reviews being completed by the time the GMT meets to discuss preliminary ABC and OY levels. However, the GMT can request additional model projections, based on reviewed model scenarios, in order to develop a full evaluation of potential management actions.

GAP Responsibilities

The chair of the GAP will appoint a representative to track each stock assessment and attend the STAR Panel meeting. The GAP representative will serve as advisor to the STAT Team and STAR Panel. It is especially important that the GAP representative be included in the STAT team's discussion and review of all the data sources being used in the assessment, prior to development of the stock assessment model. It is the responsibility of the GAP representative to insure that industry concerns about the adequacy of data being used by the STAT Team are expressed at an early stage in the process. The GAP representative will participate in review discussions as an advisor to the STAR Panel, in the same capacity as the GMT advisor.

The GAP representative, along with STAT and SSC representatives, will attend the GMT meeting at which ABC recommendations are made. The GAP representative will also attend subsequent GMT, Council, and other necessary meetings where the assessment is discussed.

The GAP representative may provide appropriate data and advice to the STAR Panel and GMT and will report to the GAP on STAR Panel and GMT meeting proceedings.

SSC Responsibilities

The Scientific and Statistical Committee (SSC) will participate in the stock assessment review process and will provide the Council and its advisory bodies with technical advice related to the stock assessments and the review process. The SSC will assign one of its members to act as chair of each STAR Panel. Following the Panel meeting, the STAR Panel chair will review the revised stock assessment and STAR Panel report for consistency with the Terms of Reference. This member is not only expected to attend the assigned STAR Panel meeting, but also the GMT meeting at which ABC recommendations are made (should the need arise), and Council meetings when groundfish stock assessment agenda items are discussed (see calendar in Appendix A). Specifically, if requested the STAR Panel chair will present the STAR Panel report to the GMT if it requires assistance in interpreting the results of a stock assessment. In addition, the chair will present the Panel's report at SSC and Council meetings. However, to insure independence in the SSC's review of stock assessments and STAR Panel proceedings, SSC members who served on a STAT Team or STAR Panel for a particular stock assessment are required to recuse themselves when that stock assessment is reviewed by the SSC, except to answer questions or present factual information. Other SSC members will be assigned the roles of discussion lead and rapporteur. The SSC's review constitutes a final independent check of the stock assessment that takes into consideration both the stock assessment and the STAR Panel report.

It is the SSC's responsibility to review and endorse any additional analytical work requested by the GMT after the stock assessment has been reviewed by the STAR Panels. In addition, the SSC will review and advise the GMT and Council on projected ABCs and OYs and, in addition, will serve as arbitrator to resolve disagreements between the STAT Team and the STAR Panel.

Council Staff Responsibilities

Council Staff will prepare meeting notices and distribute stock assessment documents, stock summaries, meeting minutes, and other appropriate documents. Council Staff will help NMFS and the state agencies in coordinating stock assessment meetings and events. Council staff will attend all STAR panels to ensure continuity and adherence to the Stock Assessment Terms of Reference. Staff will also publish or maintain file copies of reports from each STAR Panel (containing items specified in the STAR Panel's term of reference), the outline for groundfish stock assessment documents, comments from external reviewers, SSC, GMT, and GAP, letters from the public, and any other relevant information. At a minimum, the stock assessments (STAT Team reports, STAR Panel reports, and stock summaries) should be published and distributed in the Council's annual SAFE document.

Stock Assessment Priorities

Stock assessments for West Coast groundfish are conducted ~~periodically~~ to assess abundance, trends, and appropriate harvest levels for these species. Assessments use statistical population models to analyze and integrate a variety of survey, fishery and biological data. Due to the large number of groundfish species that have never been assessed, it is the goal of the Council to increase substantially the number of assessed stocks. A constraint on reaching that objective, however, is the Council's multi-year management regime, which limits assessment activities to odd years only (e.g., 2009).

The SSC recommended and the Council adopted in April 2006 a new process to initiate development of criteria for prioritizing stock assessments that may include such factors as: (1) economic or regional importance, (2) overfished status, (3) demographic sensitivity, (4) time elapsed since the last assessment~~,~~ (NMFS encourages assessments be updated at least once every 5 years), 5) data richness, 6) potential risk to the stock from the current or foreseeable management regime, and 7) qualitative trends from fishery-independent surveys (if available), etc. ~~While this process was not entirely used to recommend stock assessments during the 2007-2008 cycle, it is anticipated for the next assessment cycle and would involve the NMFS stock assessment coordinator, Council staff, GMT, and the GAP to begin scoping these issues.~~

In establishing stock assessment priorities a number of factors are considered, including:

1. Assessments should take advantage of new information, especially indices of abundance from fishery-independent surveys.

2. Overfished stocks that are under rebuilding plans should be evaluated to ensure that progress towards achieving stock recovery is adequate.

~~3. In general no more than 2 full assessments will be reviewed by a STAR Panel. In exceptional circumstances this number may be exceeded, if the SSC and NMFS Stock Assessment Coordinator conclude that it is advisable, feasible, and/or necessary to do so.~~

3. The SSC encourages attempts to study previously un-assessed stocks, and recommends that greater consideration be given to simple assessment methods that can be applied to data-poor stocks. These methods typically do not yield the same information as a full assessment, such as the ability to determine stock status relative to biomass reference points. Even so, such reports are still needed to assist the Council in making management decisions for these stocks.

4. Any stock assessment that is considered for use in management should be submitted through normal Council channels and reviewed at STAR Panel meetings.

5. The proposed stocks for assessment should be discussed by the Council at least a year in advance to allow sufficient time for assembly of relevant assessment data and for arrangement of STAR panels.

Terms of Reference for STAR Panels and Their Meetings

The principal responsibilities of the STAR Panel are to review stock assessment documents, data inputs, analytical models, and to provide complete STAR Panel reports for all reviewed species.~~-~~ The objective of the STAR Panel review is to complete a detailed evaluation of the results of a stock assessment, which puts the Panel in a good position to advance the best available scientific information to the Council. ~~Most groundfish stocks are assessed infrequently and each assessment and review should result in useful advice to the Council.~~ The STAR Panel's work includes:

1. reviewing draft stock assessment documents and any other pertinent information (e.g.; previous assessments and STAR Panel reports, if available);
2. working with STAT Teams to ensure assessments are reviewed as needed;
3. documenting meeting discussions; and
4. reviewing revised stock assessment documents before they are forwarded to the SSC.

~~Presuming two full stock assessments are under review, STAR Panels will include a Chair (appointed from the SSC) and at least three other members with experience gained from having personally conducted stock assessments. More specifically, of these three other members, one should have a thorough familiarity with west coast groundfish stock assessment practices, data sources, and modeling methods and one should be appointed from the Center for Independent Experts (CIE). In addition, individuals with a supervisory relationship with a STAT Team member are disqualified from serving on the STAR Panel. The same exclusion applies to panelists who contributed significantly to the development of an assessment. The total number of STAR Panel members (including the chair) should be four unless extenuating circumstances preclude this, e.g., a large number of stock assessments scheduled for review at a STAR Panel dictate more reviewers. In addition to Panel members, STAR meetings will include GMT and GAP advisors with responsibilities described in their terms of reference. STAR Panels normally meet for one week.~~

STAR Panels include a chairman appointed from the SSC and at least two other members with experience gained from having conducted stock assessments on the U. S. west coast or elsewhere. The total number of STAR Panel members (including the chair) should be 3 unless extenuating circumstances such as a large number of stock assessments scheduled for review at the STAR Panel dictate more reviewers. In addition to Panel members, STAR meetings will include GMT and GAP advisors with responsibilities described in their terms of reference. STAR Panels normally meet for one week.

In general no more than 2 full assessments will be reviewed by a STAR Panel. In exceptional circumstances this number may be exceeded, if the SSC and NMFS Stock Assessment Coordinator conclude that it is advisable, feasible, and/or necessary to do so. When separate assessments are conducted at the sub-stock level (i.e., black rockfish) each assessment will be considered a full assessment for review purposes. Contested assessments, in which alternative assessments are brought forward by competing STAT teams using different modeling approaches, will typically require additional time (or panel members) to review adequately, and should be scheduled accordingly. While contested assessments are likely to be rare, they can be accommodated in the STAR panel review process. STAR panels should thoroughly evaluate each analytical approach, comment on relative merits of each, and, when conflicting results are obtained, attempt to identify the reasons for the differences. STAR panels are charged with selecting a preferred base model, which will be more difficult when there are several modeling approaches from which to choose.

The STAR Panel Chair is responsible for 1) developing an agenda for the STAR panel meeting, 2) ensuring that STAR Panel members and STAT teams follow the Terms of Reference, 3) participating in the review of the assessment, 4) guiding the STAR Panel and STAT team to mutually agreeable solutions, and 5) coordinating review of final assessment documents.

The STAR Panel, STAT Team, GAP and GMT advisors, and all interested parties are legitimate meeting participants that must be accommodated in discussions. It is the STAR Panel Chair's responsibility to manage discussions and public comment so that work can be completed.

The STAR Panel is responsible for determining if a stock assessment document is sufficiently complete according to Appendix B. It is the Panel's responsibility to identify assessments that cannot be reviewed or completed for any reason. The Panel's decision that an assessment is complete should be made by consensus. If a Panel cannot reach agreement, then the nature of the disagreement must be described in the Panel's report. Moreover, if a stock assessment is deemed to be stable in its approach to data analysis and modeling, the STAR panel should recommend that the assessment be considered as an update during the next stock assessment cycle.

For some species the data will be insufficient to calculate reliable estimates of F_{MSY} (or its proxy), B_{MSY} (or its proxy), ending biomass or unfished biomass, etc. Results of these data-poor assessments typically will not meet the requirements of an assessment according to the Terms of Reference and, in those instances, each STAR Panel should consider what inferences can be drawn from the analysis presented by the STAT Team. The panel should review the reliability and appropriateness of any methods used to draw conclusions about stock status and exploitation potential and either recommend or reject the analysis on the basis of its ability to introduce useful information into the management process.

The STAR Panel's terms of reference solely concern technical aspects of the stock assessment. It is therefore important that the Panel should strive for a risk neutral perspective in its reports and deliberations. Assessment results based on model scenarios that have a flawed technical basis, or are questionable on other grounds, should be identified by the panel and excluded from the set upon which management advice is to be developed. It is recognized that a broad range of results should be reported to better define the scope of the accepted model results. The STAR Panel should comment on the degree to which the accepted model scenarios describe and quantify the major sources of uncertainty, and the degree to which the probabilities associated with these scenarios are technically sound. The STAR Panel may also provide qualitative comments on the probability of various model results, especially if the Panel does not believe that the probability distributions calculated by the STAT capture all major sources of uncertainty.

Recommendations and requests to the STAT Team for additional or revised analyses must be clear, explicit and in writing. A written summary of discussion on significant technical points and lists of all STAR Panel recommendations and requests to the STAT Team are required in the STAR Panel's report. This should be completed (at least in draft form) prior to the end of the meeting. It is the chair and Panel's responsibility to carry out any follow-up review work that is required.

~~The primary goal of the STAR Panel is to complete a detailed evaluation of the results of a stock assessment, which puts the Panel in a good position to advance the best available scientific information to the Council[2].~~ Under ideal circumstances, the STAT Team and STAR Panel should strive to reach a mutual consensus on a single base model, but it is essential that uncertainty in the analysis be captured and ~~transmitted~~ communicated to managers. A useful way of accomplishing this objective is to bracket the base model along what is deemed to be the dominant dimension of uncertainty (e.g., spawner-recruit steepness or R_0, natural mortality rate, survey catchability, recent year-class strength, weights on conflicting CPUE series, etc.). Alternative models should show contrast in their management implications, which in practical terms means that that they should result in different estimates of current stock size, stock depletion, and ABC.

Once a base model has been bracketed on either side by alternative model scenarios, which capture the overall degree of uncertainty in the assessment, a 2-way decision table analysis (states-of-nature versus management action) is the preferred way to present the repercussions of uncertainty to management. An attempt should be made to develop alternative model scenarios such that the base model is considered twice as likely as the alternative models, i.e., the ratio of probabilities should be 25:50:25 for the low stock size alternative, the base model, and the high stock size alternative (Fig. 1). Potential methods for assigning probabilities include using the statistical variance of the model estimates of stock size, posterior Monte Carlo simulation, or expert judgment, but other approaches are encouraged as long as they are fully documented. Bracketing of assessment results could be accomplished in a variety of ways, but as a matter of practice the STAR Panel should strive to identify a single preferred base model when possible, so that averaging of extremes doesn't become the *de facto* choice of management.

[2] Most groundfish stock assessments conducted for the PFMC have used the Stock Synthesis 2 (SS2) modeling framework, which has been extensively tested and provides model outputs that are compatible with the Council's harvest control rules. Nonetheless, STAT Teams are not required to use SS2. Other valid approaches are available that can be used under appropriate circumstances, especially when model performance issues have been evaluated.

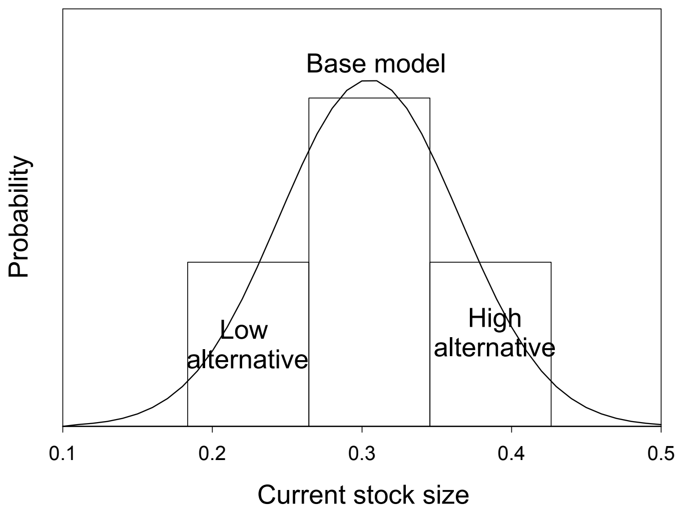


Figure 1. Example of assigning probabilities to alternative models using uncertainty in the estimate of current stock size.

To the extent possible, additional analyses required in the stock assessment should be completed during the STAR Panel meeting. It is the obligation of the STAR Panel Chair, in consultation with other Panel members, to prioritize requests for additional STAT Team analyses. Moreover, in situations where a STAT team arrives with a well-considered, thorough assessment, it may be that the Panel can conclude its review in less time than has been allotted to the meeting, i.e., early dismissal of a STAT Team is an option for well-constructed assessments. If follow-up work by the STAT Team is required after the review meeting, then it is the Panel's responsibility to track STAT Team progress. In particular, the Chair is responsible for communicating with STAT Teams (by phone, e-mail, or any convenient means) to determine if the revised stock assessment and documents are complete and ready to be used by managers in the Council family. If stock assessments and reviews are not complete at the end of the STAR Panel meeting, then the work must be completed prior to the GMT meeting where the assessments and preliminary ABC levels are discussed. Any post-STAR drafts of the stock assessment must be reviewed by the STAR Panel (or the Chair if ~~he is~~ delegated that authority by the STAR Panel). Assessments cannot be given to Council staff for distribution unless first endorsed by the STAR Panel chair. Likewise, the final draft that is published in the SAFE document must also be approved by the STAR Panel chair prior to being accepted by Council staff.

The STAR Panel's primary duty is to conduct a peer review of an assessment that is presented by a STAT Team; STAR panel meetings~~they~~ are not workshops. In the course of this review, the Panel may ask for a reasonable number of sensitivity runs, additional details of existing assessments, or similar items from the STAT team. It would not be unusual for this evaluation to result in a change to the initial base model, provided both the STAR panel and the STAT team agree. The STAR panels are expected to be judicious in their requests of the STAT teams, recognizing that some issues uncovered during review are best flagged as research priorities, and dealt with more effectively and comprehensively between assessments. The STAR Panel may also request additional analysis based on an alternative approach. However, the STAR Panel is not authorized to conduct an alternative assessment representing its own views that are distinct from those of the STAT Team, nor can it impose an alternative assessment on the Team. Similarly, the Panel should not impose as a requirement their preferred methodologies when such is a matter of professional opinion. Rather, if the Panel finds that an assessment is inadequate, it should document and report that opinion and, in addition, suggest remedial measures that could be taken by the STAT team prior to the scheduled mop-up panel review to rectify whatever perceived shortcomings may exist. The SSC will make a final recommendation on whether an assessment should be reviewed during the mop-up panel.

STAT Teams and STAR Panels are required to make a good-faith attempt to resolve any areas of disagreement during the meeting. Occasionally, fundamental differences of opinion remain between the STAR Panel and STAT

Team that cannot be resolved by discussion. In such cases, the STAR Panel must document the areas of disagreement in its report. In exceptional circumstances, the STAT team may choose to submit a supplemental report supporting its view, but in the event that such a step is taken, an opportunity must be given to the STAR panel to prepare a rebuttal. These documents will then be appended to STAR panel report as part of the record of the review meeting. The SSC will then review all information pertaining to the dispute, and issue its recommendation.

The STAR Panel Chair is expected to attend Council meetings and GMT meetings (when requested) and where stock assessments and harvest projections are discussed to explain the reviews and provide other technical information and advice. The Chair is responsible for providing the Stock Assessment Coordinator and Council staff with a suitable electronic version of the Panel report.

Suggested Template for STAR Panel Report

1. ~~Minutes~~ Summary of the STAR Panel meeting containing
   - A. Name and affiliation of STAR Panel members; and
   - B. List of analyses requested by the STAR Panel, the rationale for each request, and brief summary of the STAT response to the request.
   - C. Description of base model and alternative models used to bracket uncertainty.
2. Comments on the technical merits and/or deficiencies in the assessment and recommendations for remedies.
3. Explanation of areas of disagreement regarding STAR Panel recommendations:
   - A. Among STAR Panel members (including concerns raised by GAP and GMT representatives), and
   - B. Between the STAR Panel and STAT Team
4. Unresolved problems and major uncertainties, e.g.; any special issues that complicate scientific assessment, questions about the best model scenario.
5. Management, data, or fishery issues raised by the GMT or GAP representatives during the STAR Panel.
6. Prioritized recommendations for future research and data collection

Terms of Reference for Groundfish STAT Teams

The STAT team will carry out its work according to these terms of reference and the calendar for groundfish stock assessments.

All relevant stock assessment workshops should be attended by all STAT team members. The STAT Team shall include in both the STAR Panel draft and final assessment all data sources that include the species being assessed, identify which are used in the assessment, and provide the rationale for data sources that are excluded. The STAT Team is obliged to keep the GAP representative informed of the specific data being used in the stock assessment. The STAT team is expected to initiate contact with the GAP representative at an early stage in the process, and to be prepared to respond to concerns about the data that might be raised. The STAT Team should also contact the GMT representative for information about changes in fishing regulations that may influence data used in the assessment.

Most recent groundfish stock assessments conducted for the PFMC have used the Stock Synthesis 2 (SS2) modeling framework, which has been extensively tested and provides model outputs that are compatible with the Council's harvest control rules. Nonetheless, STAT Teams are not required to use SS2. Other valid approaches are available that can be used under appropriate circumstances.

STAT teams are strongly encouraged to develop assessments in a collaborative environment, such as by forming working groups, holding pre-assessment workshops, and consulting with other stock assessment scientists. STAT teams are also encouraged to also organize independent meetings with industry and interested parties to discuss issues, questions, and data. Each STAT Team will appoint a representative to coordinate work with the STAR Panel. Barring exceptional circumstances, all STAT team members should attend the STAR Panel meeting.

Each STAT Team conducting a full assessment will appoint a representative who will be available to attend the Council meeting where the SSC is scheduled to review the assessment, and will typically give presentations of the assessment to the SSC and to other Council advisory bodies. In addition, ~~a representative of~~ the STAT Team should be prepared to respond to GMT requests for model projections during the GMT's ~~available to attend the GMT and~~

~~Council meetings where~~development ~~preliminary~~ of ABC and OY ~~levels are discussed~~alternatives.

The STAT Team is responsible for preparing three versions of the stock assessment document: 1) a complete “draft” including an executive summary (except for decision tables) for discussion at the stock assessment review meeting; 2) a “revised draft” for distribution to the Council and advisory bodies for discussions about preliminary ABC and OY levels; 3) a “final” version to be published in the SAFE report. Post-STAR panel drafts must be reviewed by the STAR panel prior to being submitted to Council staff, but these reviews are limited to editorial issues, verifying that the required elements are included according to the Terms of Reference, and confirming that the document reflects the discussions and decisions made during the STAR panel. Other than changes authorized by the SSC, only editorial and other minor alterations should be made between the “revised draft” and “final” versions. The STAT Team will provide “draft” assessment documents to the Stock Assessment Coordinator, who will distribute them to the STAR Panel, Council, the SSC Groundfish subcommittee, and GMT and GAP representatives at least two weeks prior to the STAR Panel meeting.

Complete, fully-developed assessments are critical to the STAR panel process. Draft assessments will be evaluated for completeness prior to the STAR panel meeting, and assessments that do not satisfy minimum criteria will not be reviewed. The STAR panel chair will make an initial recommendation, which will then be reviewed by the SSC groundfish subcommittee members, council staff, and the groundfish coordinator if the chair determines that the draft assessment is not sufficiently complete. ~~.~~ The draft document should include all elements listed in Appendix B except the 1) decision table, 2) harvest projections, 3) population abundance tables, 4) point-by-point responses to current STAR Panel recommendations, and 5) acknowledgements. Incomplete assessments will be either moved to the mop-up panel, or postponed to a subsequent assessment cycle. In general, the mop-up panel will not be able to review more than two assessments, so the options are limited for assessments that are not completed on time.
~~A draft assessment will be judged complete if an external reviewer could review the assessment in its present form without additional information. In most cases, this would require 1) a least one candidate model successfully fit to available data, 2) a description of that model, 3) a description of assessment data in sufficient detail to evaluate its merits, and 4) a description the model results in sufficient detail to allow an opinion to be formed of its adequacy.~~

The STAT Team is responsible for bringing computerized data and working assessment models to the review meeting in a form that can be analyzed on site. STAT Teams should take the initiative in building and selecting candidate models and should have several complete models ready to present to the STAR Panel and be prepared to discuss the merits of each. The STAT team should identify a candidate base model, fully documented in the draft assessment, for STAR panel consideration. Fully developed assessments that are properly documented should require less time to review and approve than poorly constructed, incomplete assessments.

In most cases, the STAT Team should produce a complete draft of the assessment within three weeks of the end of the STAR Panel meeting, including any internal agency review. In any event, the STAT Team must finalize the assessment document before the briefing book deadline for the Council meeting at which the assessment is scheduled for review.

The STAT Team and the STAR Panel may disagree on technical issues regarding an assessment, but a complete stock assessment must include a point-by-point response by the STAT Team to each of the STAR Panel’s recommendations. Estimates and projections representing all sides of the disagreement need to be presented to, reviewed by, and commented upon by the SSC.

For stocks that are projected to fall below overfished thresholds, the STAT Team must complete a rebuilding analysis according to the SSC’s Terms of Reference for Groundfish Rebuilding Analyses. It is recommended that this analysis be conducted using the rebuilding software developed by Dr. Andre Punt (aepunt@u.washington.edu). The STAT Team is also responsible for preparing a document that summarizes the results of the rebuilding analysis.

Electronic versions of final assessment documents, rebuilding analyses, parameter files, data files, and key output files will be sent by the STAT Teams to the Stock Assessment Coordinator for inclusion in a stock assessment archive. Any tabular data that are inserted into the final documents in and object format should also be submitted in alternative forms (e.g., spreadsheets), which allow selection of individual data elements.

Terms of Reference for Stock Assessment Updates

The STAR process is designed to provide a comprehensive, independent review of a stock assessment. In other situations a less comprehensive review of assessment results is desirable, particularly in situations where a "model" has already been critically examined and the objective is to simply update the model by incorporating the most recent data. In this context a model refers not only to the population dynamics model *per se*, but to the particular data sources that are used as inputs to the model, the statistical framework for fitting the data, and the analytical treatment of model outputs used in providing management advice, including reference points, the allowable biological catch (ABC) and optimum yield (OY). These terms of reference establish a procedure for a limited but still rigorous review for stock assessment models that fall into this latter category. However, it is recognized that what in theory may seem to be a simple update, may in practice result in a situation that is impossible to resolve in an abbreviated process. In these cases, it may not be possible to update the assessment – rather the assessment may need to be revised in the next full assessment review cycle.

Qualification

The Scientific and Statistical Committee (SSC) will determine whether a stock assessment qualifies as an update under these terms of reference. Recommendation by a STAR Panel or the SSC that a full assessment is suitable for an update will be a principal criterion in this determination. To qualify, a stock assessment must carry forward its fundamental structure from a model that was previously reviewed and endorsed by a STAR panel. In practice this means similarity in: (a) the particular sources of data used, (b) the analytical methods used to summarize data prior to input to the model, (c) the software used in programming the assessment, (d) the assumptions and structure of the population dynamics model underlying the stock assessment, (e) the statistical framework for fitting the model to the data and determining goodness of fit, (f) the procedure for weighting of the various data components, and (g) the analytical treatment of model outputs in determining management reference points, including F_{msy}, B_{msy}, and B_0. A stock assessment update is appropriate in situations where no significant change in these seven factors has occurred, other than extending time series of data elements within particular data components used by the model, e.g., adding information from a recently completed survey and an update of landings. Extending CPUE time series based on fitted models (i.e., GLM models) will require refitting the model and updating all values in the time series. Assessments using updated CPUE time series qualify as updates if the CPUE standardization models follow applicable criteria for assessment models described above. In practice there will always be valid reasons for altering a model, as defined in this broad context, although, in the interests of stability, such changes should be resisted as much as possible. Instead, significant alterations should be addressed in the next subsequent full assessment and review.

Composition of the Review Panel

The groundfish subcommittee of the SSC will conduct the review of a stock assessment update. A lead reviewer for each updated assessment will be designated by the chair of the groundfish subcommittee from among its membership, and it will be the lead reviewer's responsibility to ensure the review is completed properly and that a written report of the proceedings is produced. In addition, the groundfish management team (GMT) and the groundfish advisory panel (GAP) will designate one person each to participate in the review.

Review Format

All stock assessment updates will be reviewed during a single meeting of the SSC Groundfish Subcommittee scheduled early in the assessment cycle. This meeting may precede or follow a normally scheduled SSC meeting. The review process will be as follows. The STAT team preparing the update will distribute the updated stock assessment to the review panelists at least two weeks prior to the review meeting. In addition, Council staff will provide panelists with a copy of the last stock assessment reviewed under the full STAR process, as well as the previous STAR panel report. Review of stock assessment updates is not expected to require analytical requests or model runs during the meeting, although large or unexpected changes in model results may necessitate some model exploration. The review will focus on two crucial questions: (1) has the assessment complied with the terms of reference for stock assessment updates and (2) are new input data and model results sufficiently consistent with previous data and results that the updated assessment can form the basis of Council decision-making. If either of these criteria is not met, then a full stock assessment will be required.

STAT Team Deliverables

Since there will be limited opportunities for revision during the review meeting, it is the STAT team's responsibility to provide the Panel with a completed update at least two weeks prior to the meeting. To streamline the process, the team can reference whatever material it chooses, including that presented in the previous stock assessment (e.g., a description of methods, data sources, stock structure, etc.). However, it is essential that any new information being incorporated into the assessment be presented in enough detail, so that the review panel can determine whether the update satisfactorily meets the Council's requirement to use the best available scientific information. Of particular importance will be a retrospective analysis showing the performance of the model with and without the updated data streams. Likewise, a decision table that highlights the consequences of alternative states of nature would be useful to the Council in adopting annual specifications. Similarly, if any minor changes to the "model" structure are adopted, above and beyond updating specific data streams, a sensitivity analysis to those changes will be required.

In addition to documenting changes in the performance of the model, the STAT Team will be required to present key assessment outputs in tabular form. Specifically, the STAT Team's final update document should include the following:

- Title page and list of preparers
- Executive Summary (see Appendix C)
- Introduction
- Documentation of updated data sources
- Short description of overall model structure
- Complete base-run results, including a tabular summary of total and spawning stock biomass and recruitment time series
- Uncertainty analysis, including retrospective analysis, decision table, etc.
- 10 year harvest projections under the default harvest policy.

Review Panel Report

The stock assessment review panel will issue a report that will include the following items:

- Name and affiliation of panelists
- Comments on the technical merits and/or deficiencies of the update
- Explanation of areas of disagreement among panelists and between the panel and STAT team
- Recommendation regarding the adequacy of the updated assessment for use in management

Appendix A: 2009-2010 Stock Assessment Review Calendar

TO BE DETERMINED

Include deadlines for inclusion of all significant data elements.

Include a post-STAR briefing where STAT teams present their findings to GMT, GAP, and the Council.

Include dates when STAT Teams provide GAP and GMT representatives with stock assessment data.

Appendix B: Outline for Groundfish Stock Assessment Documents

This is an outline of items that should be included in stock assessment reports for groundfish managed by the Pacific Fishery Management Council. The outline is a working document meant to provide assessment authors with flexible guidelines about how to organize and communicate their work. All items listed in the outline may not be appropriate or available for each assessment. Also, items flagged with asterisks (*) are optional for draft assessment documents prepared for STAR Panel meetings but should be included in the final document. In the interest of clarity and uniformity of presentation, stock assessment authors and reviewers are encouraged (but not required) to use the same organization and section names as in the outline. It is important that time trends of catch, abundance, harvest rates, recruitment and other key quantities be presented in tabular form to facilitate full understanding and follow-up work.

A. Title page and list of preparers – the names and affiliations of the stock assessment team (STAT) either alphabetically or as first and secondary authors

B. Executive Summary (see attached template and example in Appendices C and D). ~~This also serves as the STAT summary included in the SAFE.~~

C. Introduction
   1. Scientific name, distribution, the basis for the choice of stock structure, including regional differences in life history or other biological characteristics that should form the basis of management units.
   2. A map depicting the scope of the assessment and identifying boundaries for fisheries or data collection strata.
   3. Description of fisheries for this species off Canada or Alaska, including references to any recent assessments of those stocks.
   4. Important features of life history that affect management (e.g., migration, sexual dimorphism, bathymetric demography).
   5. Important features of current fishery and relevant history of fishery.
   6. Summary of ~~Management~~ management history (e.g., changes in mesh sizes, trip limits, or other management actions that may have significantly altered selection, catch rates, or discards~~, optimum yields~~).
   7. Management performance – a table or tables comparing acceptable biological catches, optimum yields, landings, and catch (i.e., landings plus discard) for each area and year

D. Assessment
   1. Data
      a. Landings by year and fishery, historical catch estimates, discards (generally specified as a percentage of total catch in weight and in units of mt), catch-at-age, weight-at-age, abundance indices (typically survey and CPUE data), data used to estimate biological parameters (e.g.; growth rates, maturity schedules, and natural mortality) with coefficients of variation (CVs) or variances if available. Include complete tables and figures and date of extraction.
      b. Sample size information for length and age composition data by area, year, gear, market category, etc., including both the number of trips and fish sampled.
      c. All data sources that include the species being assessed, which are used in the assessment, and provide the rationale for data sources that are excluded.
   2. History of modeling approaches used for this stock – changes between current and previous assessment models
      a. Response to STAR Panel recommendations from the most recent previous assessment.
      b. Report of consultations with GAP and GMT representatives regarding the use of various data sources in the stock assessment.
   3. Model description
      a. Complete description of any new modeling approaches.
      b. Definitions of fleets and areas.
      d. Assessment program with last revision date (i.e., date executable program file was compiled).
      e. List and description of all likelihood components in the model.
      f. Constraints on parameters, selectivity assumptions, natural mortality, assumed level of age reader agreement or assumed ageing error (if applicable), and other assumed parameters.
      g. Description of stock-recruitment constraints or components.

    h. Description of how the first year that is included in the model was selected and how the population state at the time is defined (e.g., B_0, stable age structure, etc.).
    i. Critical assumptions and consequences of assumption failures.
4. Model selection and evaluation
    a. Evidence of search for balance between model realism and parsimony.
    b. Comparison of key model assumptions, include comparisons based on nested models (e.g.; asymptotic vs. domed selectivities, constant vs. time-varying selectivities).
    c. Summary of alternate model configurations that were tried but rejected.
    d. Likelihood profile for the base-run (or proposed base-run model for a draft assessment undergoing review) configuration over one or more key parameters (e.g., M, h, Q) to show consistency among input data sources.
    e. Residual analysis for the base-run configuration (or proposed base-run model in a draft assessment undergoing review) ~~(~~e.g.; residual plots, time series plots of observed and predicted values, or other~~-~~ approaches~~)~~. Note that model diagnostics *are* required in draft assessments undergoing review.
    f. Convergence status and convergence criteria for the base-run model (or proposed base-run).
    g. Randomization run results or other evidence of search for global best estimates.
    h. Evaluation of model parameters. Do they make sense? Are they credible?
    i. Are model results consistent with assessments of the same species in Canada and Alaska? Are parameter estimates (e.g., survey catchability) consistent with estimates for related stocks?
5. Point-by-point response to the STAR Panel recommendations.~~.~~* (Not required in draft assessment undergoing review.)
6. ~~-~~Base-run(s) results
    a. Table listing all explicit parameters in the stock assessment model used for base runs, their purpose (e.g.; recruitment parameter, selectivity parameter) and whether or not the parameter was actually estimated in the stock assessment model.
    b. Population numbers at age × year × sex (if sex-specific M, growth, or selectivity) (May be provided as a text file).* (Not required in draft assessment undergoing review.)
    c. Time-series of total, summary, and spawning biomass, depletion relative to B_0, recruitment and fishing mortality or exploitation rate estimates (table and figures).
    d. Selectivity estimates (if not included elsewhere).
    e. Stock-recruitment relationship.
7. Uncertainty and sensitivity analyses. The best approach for describing uncertainty and the range of probable biomass estimates in groundfish assessments may depend on the situation. Important factors to consider include:
    a. Parameter uncertainty (variance estimation conditioned on a given model, estimation framework, data set choice, and weighting scheme), including likelihood profiles of important assessment parameters (e.g., natural mortality). This also includes expressing uncertainty in derived outputs of the model and estimating CVs by an appropriate methods (e.g., bootstrap, asymptotic methods, Bayesian approaches, ~~or~~ such as MCMC).
    b. Sensitivity to data set choice and weighting schemes (e.g., emphasis factors), which may also include a consideration of recent patterns in recruitment.
    c. Sensitivity to assumptions about model structure, i.e., model specification uncertainty.
    d. Retrospective analysis, where the model is fitted to a series of shortened input data sets, with the most recent years of input data being dropped.
    e. Historical analysis (plot of actual estimates from current and previous assessments).
    f. Subjective appraisal of the magnitude and sources of uncertainty.
    g. If a range of model runs is used to characterize uncertainty it is important to provide some qualitative or quantitative information about relative probability of each.
    h. If possible, ranges depicting uncertainty should include at least three runs: (a) one judged most probable; (b) at least one that depicts the range of uncertainty in the direction of lower current biomass levels; and (c) one that depicts the range of uncertainty in the direction of higher current biomass levels. The entire range of uncertainty should be carried through stock projections and decision table analyses.

~~E. Rebuilding analyses~~

~~1. Determine B_0. The values for spawners are preferably measured as total population egg production, but female spawning biomass is a common proxy.~~

2. ~~$B_{msy} = 0.4 B_0$;~~
3. ~~Mean generation time; and~~
4. ~~Forward projection using a Monte Carlo re-sampling of recruitments expected to occur as the stock rebuilds, where future recruitments typically are taken from the recent time series of estimated recruitments or recruits per spawner. Alternatively, if a credible stock-recruitment relationship can be estimated, it could be used to project population growth. Either approach can be conducted using the Punt rebuilding software (see above).~~

~~F~~E. Reference points (biomass and exploitation rate).
1. Unfished spawning stock biomass, summary age biomass, and recruitment.
2. Reference points based on $B_{40\%}$ (spawning biomass, SPR, exploitation rate, equilibrium yield).
3. Reference points based on default SPR proxy (spawning biomass, SPR, exploitation rate, equilibrium yield).
4. Reference points based on MSY (if estimated) (spawning biomass, SPR, exploitation rate, equilibrium yield).
5. Equilibrium yield curve showing various BMSY proxies (see attached example).
2. ~~Spawning stock biomass that produces MSY (provide $B_{40\%}$ proxy).~~
3. ~~SPR_{MSY} or F_{MSY} (specify which), and the basis for the estimate (based on the F_{MSY} proxy).~~
4. ~~Exploitation Rate corresponding to SPR_{MSY} or F_{MSY} (if available).~~
5. ~~Estimate of MSY and the basis for the estimate (based on the F_{MSY} proxy).~~

~~G~~F. Harvest projections and decision tables * (Not required in draft assessment undergoing review.)
1. Harvest projections and decision tables (i.e., a matrix of states of nature versus management action) should cover the plausible range of uncertainty about current biomass and the full range of candidate fishing mortality targets used for the stock or requested by the GMT. These should at least include calculation of the ABC based on F_{MSY} (or its proxy) and the OY that is implied under the Council's 40:10 harvest policy. Ideally, the alternatives described in the decision table will be drawn from a probability distribution which describes the pattern of uncertainty regarding the status of the stock and the consequences of alternative future management actions. Where alternatives are not formally associated with a probability distribution, the document needs to present sufficient information to guide assignment of approximate probabilities to each alternative. Decision tables should follow the format of the example Executive Summary for canary rockfish (Appendix ~~4~~D of this document) in which the columns represent the states of nature and the rows the management decisions. In most cases, management decisions will represent the sequence of catches obtained by applying the Council 40-10 harvest policy to each state of nature; however other alternatives may be suggested by the GMT as being more relevant to Council decision-making. For example, when recent catches are much less than the OY, there may be more interest in status quo projections.
2. Information presented should include biomass, stock depletion, and yield projections of ABC and OY for ten years into the future, beginning with the first year for which management action could be based upon the assessment.

~~H~~G. Regional management considerations.
1. Discuss whether a regional management approach make sense for the species from a biological perspective.
2. If there are insufficient data to analyze a regional management approach, what are the research and data needs to answer this question?

~~I~~H. Research needs (prioritized).

~~J~~I. Acknowledgments-include STAR Panel members and affiliations as well as names and affiliations of persons who contributed data, advice or information but were not part of the assessment team. * (Not required in draft assessment undergoing review.)

~~K~~J. Literature cited.

~~L~~K. An appendix with the complete parameter and data in the native code of the stock assessment program.

(For a draft assessment undergoing review, these listings can be provided as text files or in spreadsheet format.)

Appendix C: Template for Executive Summary Prepared by STAT Teams

Stock: species/area, including an evaluation of any potential biological basis for regional management

Catches: trends and current levels-include table for last ten years and graph with long term data

Data and assessment: date of last assessment, type of assessment model, data available, new information, and information lacking

Unresolved problems and major uncertainties: any special issues that complicate scientific assessment, questions about the best model scenario, etc.

Reference points: management targets and definition of overfishing, including the harvest rate that brings the stock to equilibrium at $B_{40\%}$ (the B_{MSY} proxy) and the equilibrium stock size that results from fishing at the default harvest rate (the F_{MSY} proxy).

Stock biomass: trends and current levels relative to virgin or historic levels, description of uncertainty-include table for last 10 years and graph with long term estimates

Recruitment: trends and current levels relative to virgin or historic levels-include table for last 10 years and graph with long term estimates

Exploitation status: exploitation rates (i.e., total catch divided by exploitable biomass, or the annual SPR harvest rate) – include a table with the last 10 years of data and a graph showing the trend in fishing mortality relative to the target (y-axis) plotted against the trend in biomass relative to the target (x-axis).

Management performance: catches in comparison to ABC and OY values for the most recent 10 years (when available), overfishing levels, actual catch and discard.

Forecasts: ten-year forecasts of catch, summary biomass, spawning biomass, and depletion.* (Not required in draft assessments undergoing review.)

Decision table: projected yields (ABC and OY), spawning biomass, and stock depletion levels for each year.* (Not required in draft assessments undergoing review.)

Research and data needs: identify information gaps that seriously impede the stock assessment.

Rebuilding Projections: principal results from rebuilding analysis if the stock is overfished.* This section should be included in the Final/SAFE version assessment document but is not required for draft assessments undergoing review. See Rebuilding Analysis Terms of Reference for detailed information on rebuilding analysis requirements.

Summary Table: as detailed in the attached ~~spreadsheet~~example.

Appendix D: Example a Complete Stock Assessment Executive Summary

Executive Summary

Stock

This assessment reports the status of the canary rockfish (*Sebastes pinniger*) resource off the coast of the United States from southern California to the U.S.-Canadian border using data through 2006. The resource is modeled as a single stock. Spatial aspects of the coast-wide population are addressed through geographic separation of data sources/fleets where possible and consideration of residual patterns that may be a result of inherent stock structure. There is currently no genetic evidence that there are distinct biological stocks of canary rockfish off the U.S. coast and very limited tagging data to describe adult movement, which may be significant across depth and latitude. Future efforts to specifically address regional management concerns will require a more spatially explicit model that likely includes the portion of the canary rockfish stock residing in Canadian waters off Vancouver Island.

Catches

Catch of canary rockfish is first reported in 1916 in California. Since that time, annual catch has ranged from 46.5 mt in 2004 to 5,544 in 1982 and totaled almost 150,000 mt over the time-series. Canary rockfish have been primarily caught by trawl fleets, on average comprising ~85% of the annual catches, with the Oregon fleet removing as much as 3,941 mt in 1982. Historically just 10% of the catches have come from non-trawl commercial fisheries, although this proportion reached 24% and 358 mt in 1997. Recreational removals have averaged just 6% of the total catch, historically, but have become relatively more important as commercial landings have been substantially reduced in recent years. Recreational catches reached 59% of the total with 30 mt caught in 2003. Total catches after 1999 have been reduced by an order of magnitude in an attempt to rebuild a stock determined to be overfished on the basis of the 1999 assessment.

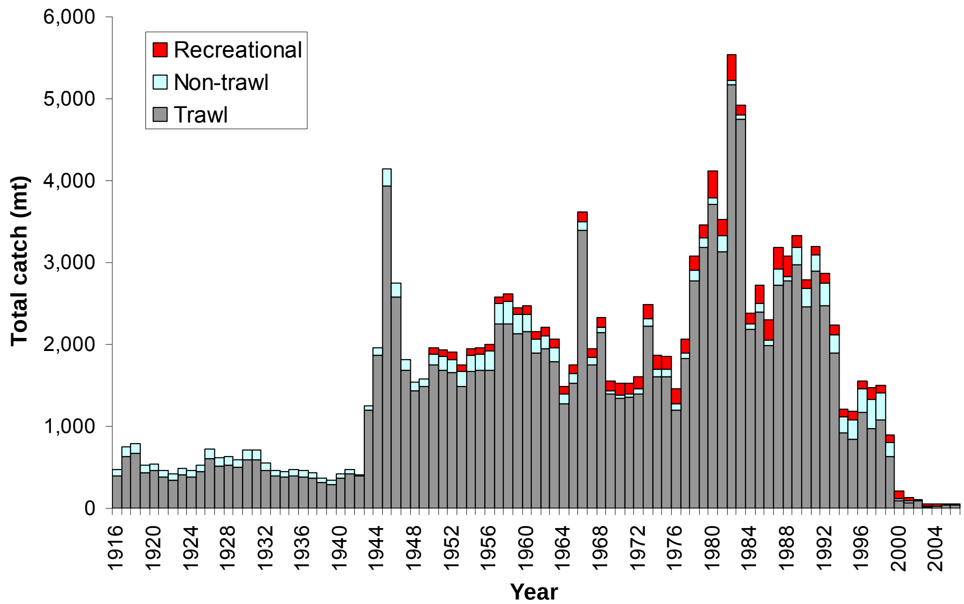


Figure a. Canary rockfish catch history by major source, 1916-2006.

Table a. Recent commercial fishery catches (mt) by fleet.

Year	Southern California trawl	Northern California trawl	Oregon trawl	Washington trawl	Southern California non-trawl	Northern California non-trawl	Oregon-Washington non-trawl	At-sea whiting bycatch
1997	31.96	142.66	589.85	203.44	29.78	73.80	254.42	3.63
1998	8.41	149.45	716.05	203.01	23.33	57.25	250.13	5.47
1999	7.36	96.25	387.85	139.97	8.53	28.59	123.97	5.63
2000	1.71	11.24	46.62	32.66	2.52	5.50	10.25	2.35
2001	1.44	9.43	33.13	19.65	1.60	4.96	11.00	4.05
2002	0.36	14.62	32.60	33.29	0.02	0.08	3.15	5.24
2003	0.23	0.31	5.02	6.24	0.00	0.08	6.89	0.93
2004	0.61	1.95	7.67	7.73	0.02	0.06	4.68	5.22
2005	0.72	2.84	4.91	25.90	0.06	0.09	1.79	1.44
2006	3.57	2.28	2.91	15.64	0.00	0.00	3.11	1.09

Data and Assessment

This assessment used the Stock Synthesis 2 integrated length-age structured model. The model includes catch, length- and age-frequency data from 11 fishing fleets, including trawl, non-trawl and recreational sectors. Biological data is derived from both port and on-board observer sampling programs. The National Marine Fisheries Service (NMFS) triennial bottom trawl survey and Northwest Fisheries Science Center (NWFSC) trawl survey relative biomass indices and biological sampling provide fishery independent information on relative trend and demographics of the canary stock. The Southwest Fisheries Science Center (SWFSC)/NWFSC/Pacific Whiting Conservation Cooperative (PWCC) coast-wide pre-recruit survey provides a source of recent recruitment strength information.

New analysis of the triennial survey data led to separating the series into two parts (1980-1992, 1995-2004) to allow for potential changes in catchability due to timing of survey operations. Accommodation of potential changes in fishery selectivity due to management actions including the adoption of canary-specific trip limits in 1995, small-footrope requirements in 1999, closure of the RCA in 2002 and use of selective flatfish trawl starting in 2005 was also added in this assessment. These and other changes have resulted in a change in the estimate of current stock status and large increase in the perception of uncertainty regarding this quantity in comparison to the most recent 2005 and earlier assessments.

The base case assessment model includes parameter uncertainty from a variety of sources, but underestimates the considerable uncertainty in recent trend and current stock status. For this reason, in addition to asymptotic confidence intervals (based upon the model’s analytical estimate of the variance near the converged solution), two alternate states of nature regarding stock productivity (via the steepness parameter of the stock-recruitment relationship) are presented. The base case model (steepness = 0.51) is considered to be twice as likely as the two alternate states (steepness = 0.35, 0.72) based on the results of a meta-analysis of west coast rockfish (M. Dorn, personal communication). In order to best capture this source of uncertainty, all three states of nature will be used as probability-weighted input to the rebuilding analysis.

Stock biomass

Canary rockfish were relatively lightly exploited until the early 1940's, when catches increased and a decline in biomass began. The rate of decline in spawning biomass accelerated during the late 1970s, and finally reached a minimum (13% of unexploited) in the mid 1990s. The canary rockfish spawning stock biomass is estimated to have been increasing since that time, in response to reductions in harvest and above average recruitment in the preceding decade. However, this trend is very uncertain. The estimated relative depletion level in 2007 is 32.4% (~95% asymptotic interval: 24-41%, ~75% interval based on the range of states of nature: 12-56%), corresponding to 10,544 mt (asymptotic interval: 7,776-13,312 mt, states of nature interval: 4,009-17,519) of female spawning biomass in the base model.

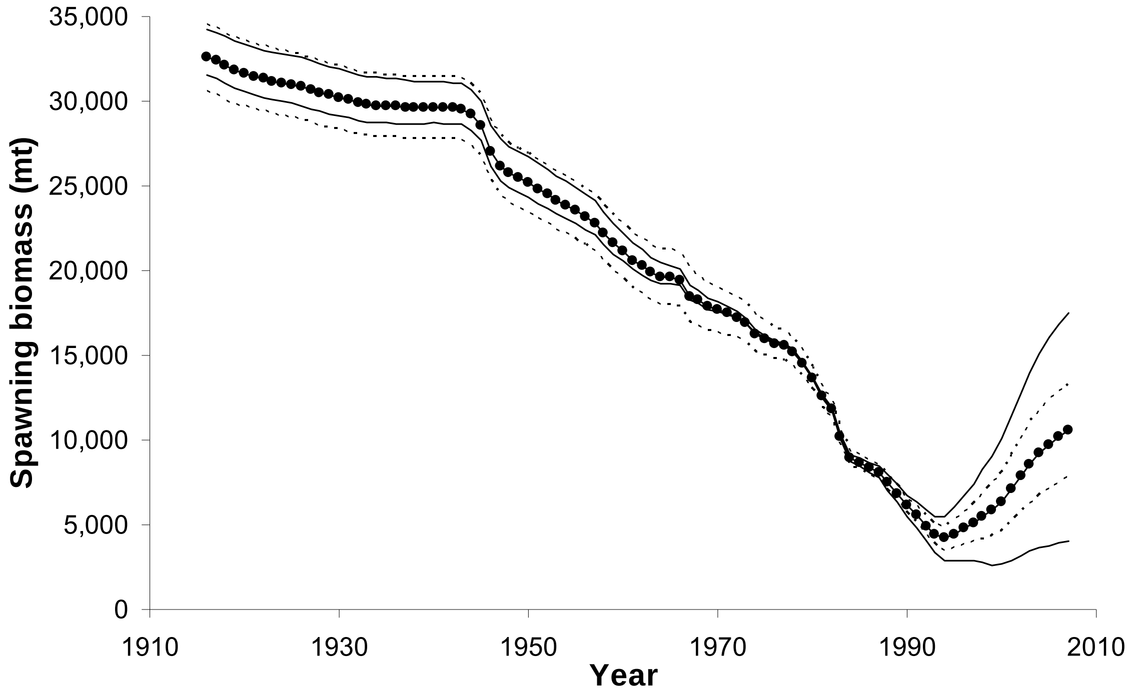


Figure b. Estimated spawning biomass time-series (1916-2007) for the base case model (round points) with approximate asymptotic 95% confidence interval (dashed lines) and alternate states of nature (light lines).

Table b. Recent trend in estimated canary rockfish spawning biomass and relative depletion level.

Year	Spawning biomass (mt)	~95% confidence interval	Range of states of nature	Estimated depletion	~95% confidence interval	Range of states of nature
1998	5,499	4,177-6,820	2,761-8,241	16.9%	NA	8.1-26.2
1999	5,826	4,296-7,357	2,610-9,073	17.9%	NA	7.6-28.8
2000	6,364	4,618-8,111	2,644-10,144	19.5%	NA	7.7-32.2
2001	7,149	5,190-9,109	2,918-11,477	22.0%	NA	8.5-36.4
2002	7,910	5,750-10,070	3,184-12,779	24.3%	NA	9.3-40.6
2003	8,603	6,264-10,942	3,417-13,985	26.4%	NA	10.0-44.4
2004	9,226	6,736-11,715	3,628-15,076	28.3%	NA	10.6-47.9
2005	9,749	7,140-12,359	3,795-16,019	29.9%	NA	11.1-50.9
2006	10,183	7,482-12,884	3,918-16,825	31.3%	23.1-39.4	11.4-53.4
2007	10,544	7,776-13,312	4,009-17,519	32.4%	24.1-40.7	11.7-55.6

Recruitment

The degree to which canary rockfish recruitment declined over the last 50 years is closely related to the level of productivity (stock-recruit steepness) modeled for the stock. High steepness values imply little relationship between spawning stock and recruitment, while low steepness values cause a strong correlation. After a period of above average recruitments, recent year-class strengths have generally been low, with only 1999 and 2001 producing large estimated recruitments (the 2007 recruitment is based only on the stock-recruit function). There is little information other than the pre-recruit index to inform the assessment model about recruitments subsequent to 2002, so those estimates will likely be updated in future assessments. As the larger recruitments from the late 1980s and early 1990s move through the population in future projections, the effects of recent poor recruitment will tend to slow the rate of recovery.

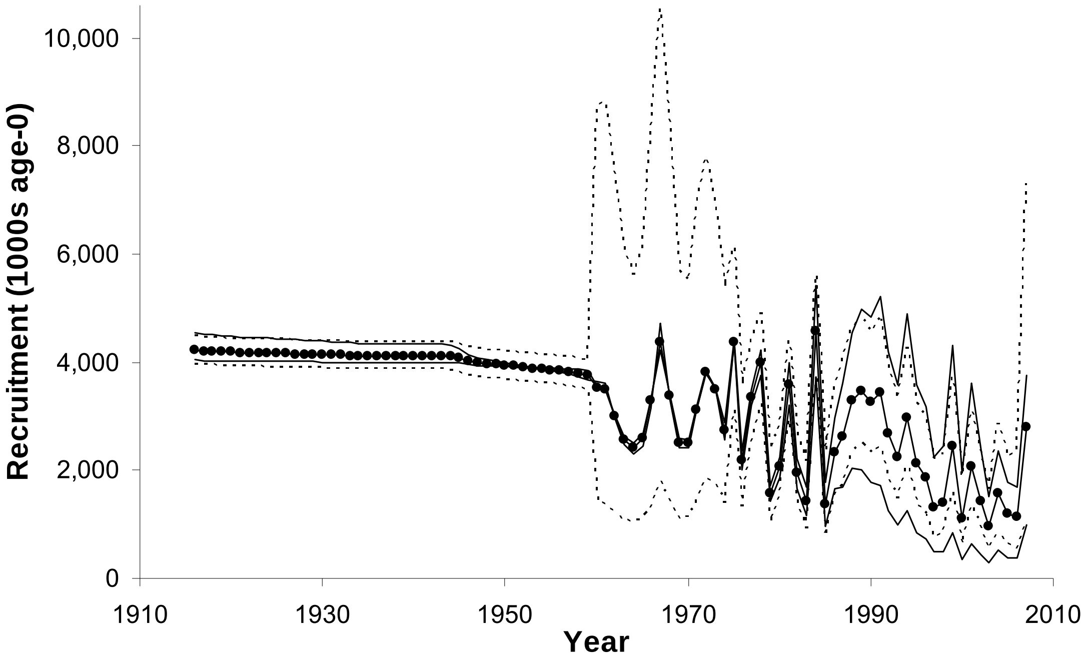


Figure c. Time series of estimated canary rockfish recruitments for the base case model (round points) with approximate asymptotic 95% confidence interval (dashed lines) and alternate states of nature (light lines).

Table c. Recent estimated trend in canary rockfish recruitment.

Year	Estimated recruitment (1000s)	~95% confidence interval	Range of states of nature
1998	1,391	841-2,299	484-2,453
1999	2,449	1,606-3,735	841-4,318
2000	1,099	638-1,893	351-1,938
2001	2,061	1,359-3,124	643-3,613
2002	1,432	905-2,267	447-2,383
2003	955	547-1,667	302-1,515
2004	1,565	854-2,869	520-2,373
2005	1,182	627-2,231	390-1,771
2006	1,144	548-2,389	367-1,699
2007	2,807	1,078-7,313	991-3,745

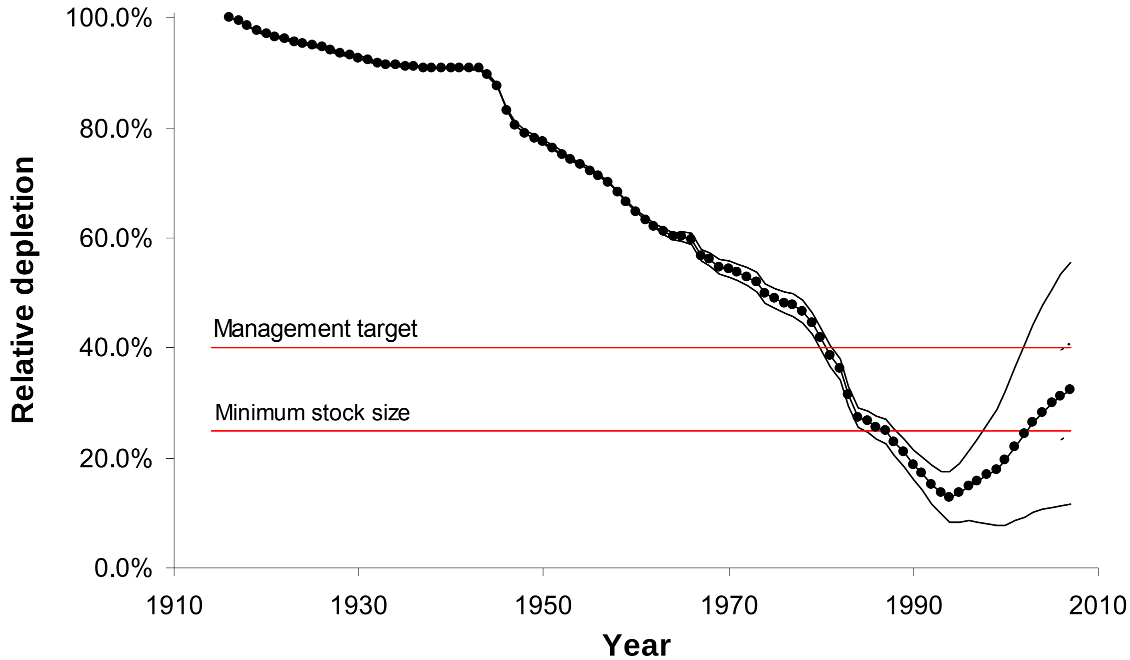


Figure d. Time series of depletion level as estimated in the base case model (round points) with approximate asymptotic 95% confidence interval (2006-2007 only, dashed lines) and alternate states of nature (light lines).

Reference points

Unfished spawning stock biomass was estimated to be 32,561 mt in the base case model. This is slightly smaller than the equilibrium value estimated in the 2005 assessment. The target stock size ($SB_{40\%}$) is therefore 13,024 mt. Maximum sustained yield (MSY) applying current fishery selectivity and allocations (a 'bycatch-only' scenario) was estimated in the assessment model to occur at a spawning stock biomass of 12,394 mt and produce an MSY catch of 1,169 mt (SPR = 52.9%). This is nearly identical to the yield, 1,167 mt, generated by the SPR (54.4%) that stabilizes the stock at the $SB_{40\%}$ target. The fishing mortality target/overfishing level (SPR = 50.0%) generates a yield of 1,161 mt at a stock size of 11,161 mt.

When selectivity and allocation from the mid 1990s (1994-1998) was applied, to mimic reference points under a targeted fishery scenario, the yield increased to 1,578 mt from a slightly smaller stock size (12,211 mt), but a similar rate of exploitation (SPR=52.5%). This is due to higher relative selection of older and larger fish when the fishery was targeting instead of avoiding canary rockfish. These values are appreciably higher than those from previous assessment models due primarily to the difference in steepness.

Exploitation status

The abundance of canary rockfish was estimated to have dropped below the $SB_{40\%}$ management target in 1981 and the overfished threshold in 1987. In hindsight, the spawning stock biomass passed through the target and threshold levels at a time when the annual catch was averaging more than twice the current estimate of the MSY. The stock remains below the rebuilding target, although the spawning stock biomass appears to have been increasing since 1999. The degree of increase is very sensitive to the value for steepness (state of nature), and is projected to slow as recent (and below average) recruitments begin to contribute to the spawning biomass. Fishing mortality rates in excess of the current F-target for rockfish of $SPR_{50\%}$ are 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 95%. Relative exploitation rates (catch/biomass of age-5 and older fish) are estimated to have been less than 1% since 2001. These patterns are largely insensitive to the three states of nature.

Table d. Recent trend in spawning potential ratio (SPR) and relative exploitation rate (catch/biomass of age-5 and older fish).

Year	Estimated SPR (%)	Range of states of nature	Relative exploitation rate	Range of states of nature
1997	31.6%	16.9-41.9	0.0889	0.0607-0.1652
1998	33.2%	16.8-44.3	0.0873	0.0576-0.1778
1999	48.9%	26.1-61.0	0.0506	0.0323-0.1146
2000	84.0%	65.7-89.7	0.0112	0.0070-0.0271
2001	89.7%	76.5-93.5	0.0067	0.0041-0.0165
2002	92.2%	81.9-95.1	0.0050	0.0031-0.0126
2003	95.4%	88.3-97.2	0.0023	0.0014-0.0058
2004	96.3%	90.6-97.8	0.0020	0.0012-0.0051
2005	96.3%	90.5-97.7	0.0021	0.0013-0.0055
2006	96.5%	90.7-97.9	0.0019	0.0011-0.0049

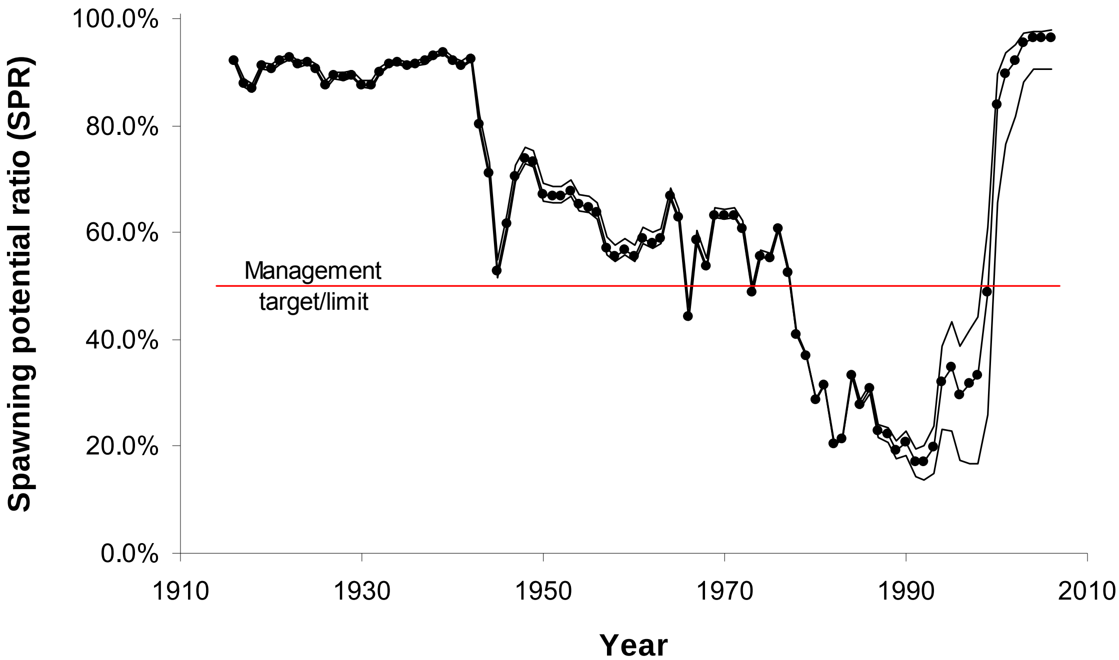


Figure e. Time series of estimated spawning potential ratio (SPR) for the base case model (round points) and alternate states of nature (light lines). Values of SPR below 0.5 reflect harvests in excess of the current overfishing proxy.

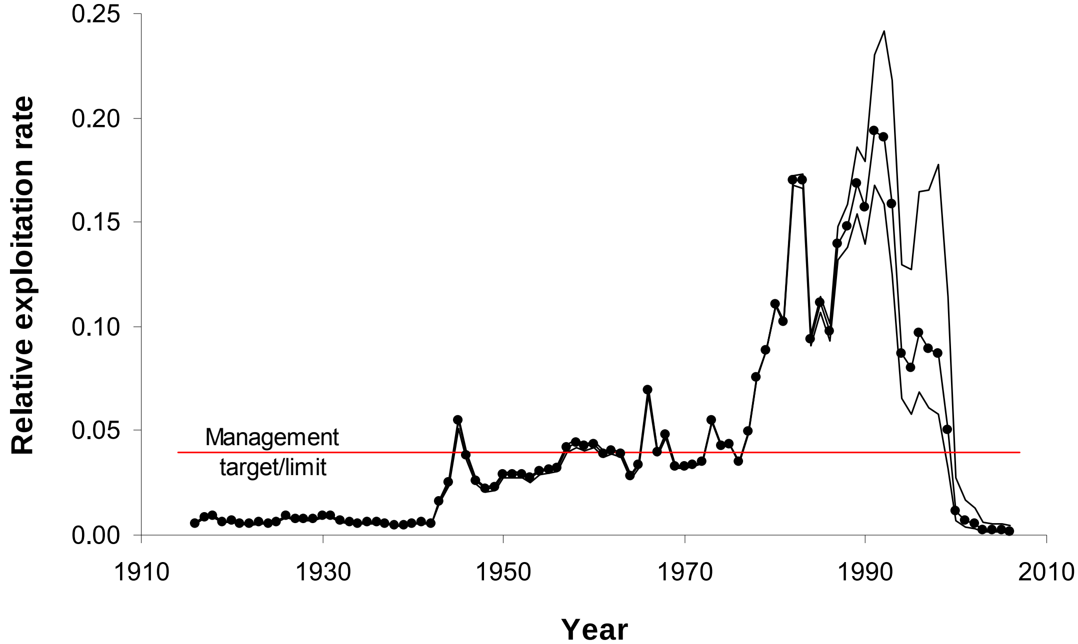


Figure f. Time series of estimated relative exploitation rate (catch/age 5 and older biomass, lower panel) for the base case model (round points) and alternate states of nature (light lines). Values of relative exploitation rate in excess of horizontal line are above the rate corresponding to the overfishing proxy from the base case.

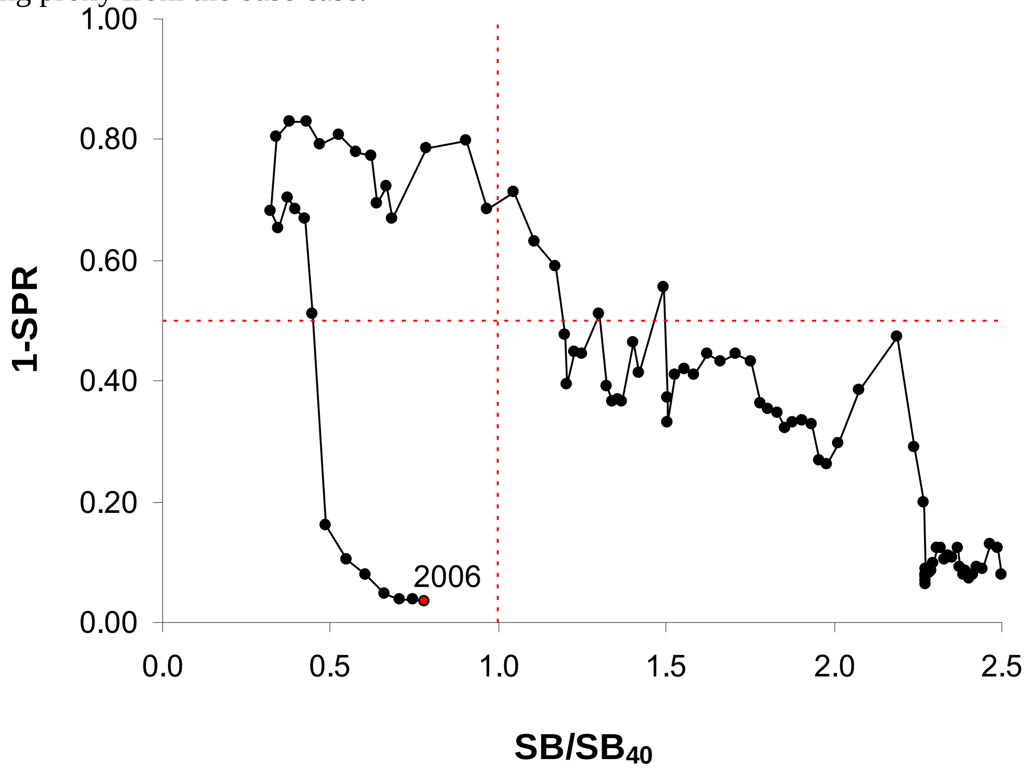


Figure g. Estimated spawning potential ratio relative to the proxy target of 50% vs. estimated spawning biomass relative to the proxy 40% level from the base case model. Higher biomass occurs on the right side of the x-axis, higher exploitation rates occur on the upper side of the y-axis.

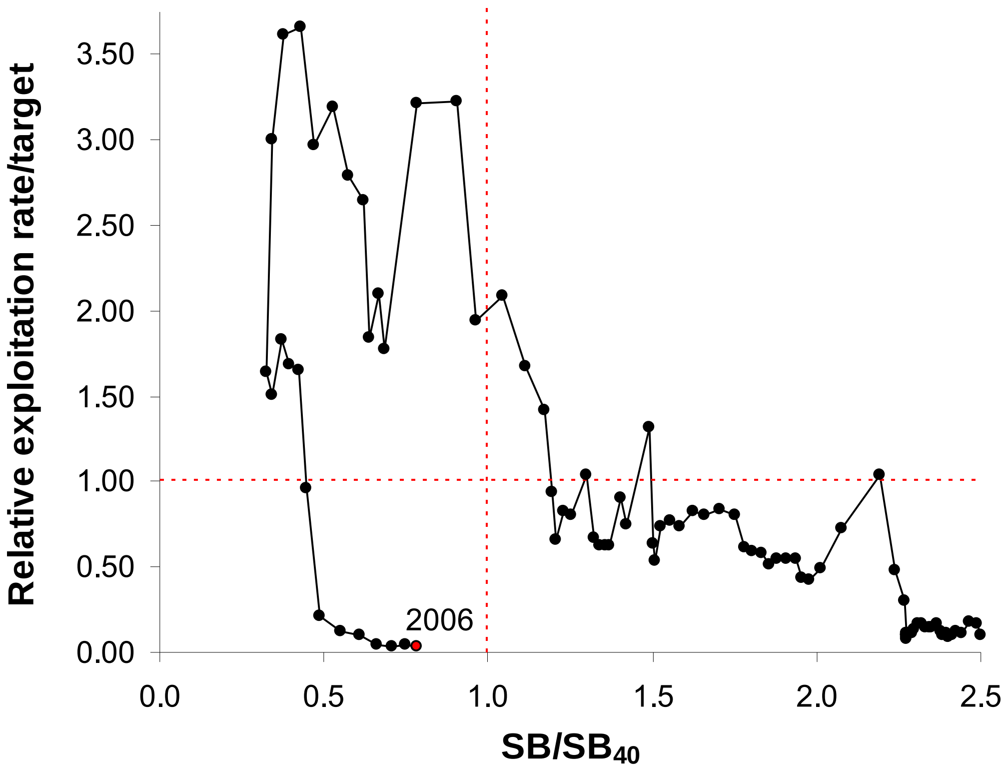


Figure g. Phase plot of estimated fishing intensity vs. relative spawning biomass for the base case model. Fishing intensity is the relative exploitation rate divided by the level corresponding to the overfishing proxy (0.040). Relative spawning biomass is annual spawner abundance divided by the 40% rebuilding target.

Management performance

Following the 1999 declaration that the canary rockfish stock was overfished the canary OY was reduced by over 70% in 2000 and by the same margin again over the next three years. Managers employed several tools in an effort to constrain catches to these dramatically lower targets. These included: reductions in trip/bag limits for canary and co-occuring species, the institution of spatial closures, and new gear restrictions intended to reduce trawling in rocky shelf habitats and the coincident catch of rockfish in shelf flatfish trawls. In recent years, the total mortality has been near the OY, but well below the ABC. Since the overfished determination in 1999, the total 7-year catch (644 mt) has been only 13% above the sum of the OYs for 2000-2006. This level of removals represents only 35% of the sum of the ABCs for that period. The total 2006 catch (47 mt) is <1% of the peak catch that occurred in the early 1980s.

Table e. Recent trend in estimated total canary rockfish catch and commercial landings (mt) relative to management guidelines.

Year	ABC (mt)	OY (mt)	Commercial landings (mt)[1]	Total Catch (mt)
1997	1,220[2]	1,000[2]	1,113.8	1,478.8
1998	1,045[2]	1,045[2]	1,182.4	1,494.2
1999	1,045[2]	857[2]	665.7	898.0
2000	287	200	60.6	208.4
2001	228	93	42.8	133.6
2002	228	93	48.6	106.8
2003	272	44	8.5	51.0
2004	256	47.3	10.7	46.5
2005	270	46.8	10.9	51.4
2006	279	47	8.2	47.1

[1]Excludes all at-sea whiting, recreational and research catches.
[2]Includes the Columbia and Vancouver INPFC areas only.

Unresolved problems and major uncertainties

Parameter uncertainty is explicitly captured in the asymptotic confidence intervals reported throughout this assessment for key parameters and management quantities. These intervals reflect the uncertainty in the model fit to the data sources included in the assessment, but do not include uncertainty associated with alternative model configurations, weighting of data sources (a combination of input sample sizes and relative weighting of likelihood components), or fixed parameters. Specifically, there appears to be conflicting information between the length- and age-frequency data regarding the degree of stock decline, making the model results sensitive to the relative weighting of each. This issue is explored in the assessment, but cannot be fully resolved at this time. The relationship between the degree of dome in the selectivity curves and the increase in female natural mortality with age remains a source of uncertainty that is included in model results, as it has been in previous assessments for canary rockfish. Uncertainty in the steepness parameter of the stock-recruitment relationship is significant and will likely persist in future assessments; this uncertainty is included in the assessment and rebuilding projections through explicit consideration of the three states of nature.
Forecasts

The forecast reported here will be replaced by the rebuilding analysis to be completed in September-October 2007 following SSC review of the stock assessment. In the interim, the total catch in 2007 and 2008 is set equal to the OY (44 mt). The exploitation rate for 2009 and beyond is based upon an SPR of 88.7%, which approximates the harvest level in the current rebuilding plan. Uncertainty in the rebuilding forecast will be based upon the three states of nature for steepness and random variability in future recruitment deviations for each rebuilding simulation. Current medium-term forecasts predict slow increases in abundance and available catch, with OY values for 2009 and 2010 increasing by nearly four times the value of 44 mt from the 2005 assessment. This is largely attributable to the revised perception of steepness, based on meta-analysis of other rockfish species. The following table shows the projection of expected canary rockfish catch, spawning biomass and depletion.

Table f. Projection of potential canary rockfish ABC, OY, spawning biomass and depletion for the base case model based on the SPR= 0.887 fishing mortality target used for the last rebuilding plan (OY) and $F_{50\%}$ overfishing limit/target (ABC). Assuming the OY of 44 mt is met in 2007 and 2008.

Year	ABC (mt)	OY (mt)	Age 5+ biomass (mt)	Spawning biomass (mt)	Depletion
2007	973	44	25,995	10,544	32.4%
2008	978	44	26,417	10,840	33.3%
2009	981	162	26,859	11,072	34.0%
2010	980	162	26,995	11,194	34.4%
2011	992	164	27,018	11,254	34.6%
2012	1,026	169	27,440	11,266	34.6%
2013	1,074	177	27,985	11,260	34.6%
2014	1,124	185	28,656	11,280	34.6%
2015	1,171	193	29,445	11,368	34.9%
2016	1,214	200	30,332	11,545	35.5%
2017	1,253	207	31,297	11,812	36.3%
2018	1,290	213	32,317	12,156	37.3%

Decision table

Because canary rockfish is currently managed under a rebuilding plan, this decision table is only intended to better compare and contrast the base case with uncertainty among states of nature. The results of the rebuilding plan will integrate these three states of nature as well as projected recruitment variability. Further, various alternate probabilities of rebuilding by target and limit time-periods as well as fishing mortality rates will be evaluated in the rebuilding analysis. Relative probabilities of each state of nature are based on a meta-analysis for steepness of west coast rockfish (M. Dorn, AFSC, personal communication). Landings in 2007-2008 are 44 mt for all cases. Selectivity and fleet allocations are projected at the average 2003-2006 values.

Table g. Decision table of 12-year projections for alternate states of nature (columns) and management options (rows) beginning in 2009. Relative probabilities of each state of nature are based on a meta-analysis for steepness of west coast rockfish (M. Dorn, AFSC, personal communication). Landings in 2007-2008 are 44 mt for all cases. Selectivity and fleet allocations are projected at the average 2003-2006 values.

			State of nature					
			Low steepness (0.35)		Base case (steepness = 0.51)		High steepness (0.72)	
Relative probability			0.25		0.5		0.25	
Management decision	Year	Catch (mt)	Depletion	Spawning biomass (mt)	Depletion	Spawning biomass (mt)	Depletion	Spawning biomass (mt)
Rebuilding SPR 88.7% catches from low steepness state of nature	2009	56	12.0%	4,099	34.0%	11,072	59.0%	18,583
	2010	56	12.0%	4,100	34.5%	11,236	60.1%	18,932
	2011	56	11.9%	4,078	34.8%	11,339	60.8%	19,156
	2012	59	11.8%	4,042	35.0%	11,396	61.2%	19,270
	2013	62	11.7%	4,003	35.1%	11,436	61.3%	19,313
	2014	65	11.6%	3,979	35.3%	11,502	61.4%	19,343
	2015	67	11.6%	3,984	35.7%	11,638	61.7%	19,423
	2016	70	11.7%	4,025	36.4%	11,866	62.2%	19,590
	2017	72	12.0%	4,102	37.4%	12,188	63.0%	19,852
	2018	74	12.3%	4,209	38.7%	12,591	64.1%	20,199
Rebuilding SPR 88.7% catches from base case	2009	162	12.0%	4,099	34.0%	11,072	59.0%	18,583
	2010	162	11.8%	4,058	34.4%	11,194	60.0%	18,890
	2011	164	11.7%	3,994	34.6%	11,254	60.5%	19,069
	2012	169	11.4%	3,914	34.6%	11,266	60.8%	19,138
	2013	177	11.2%	3,831	34.6%	11,260	60.7%	19,135
	2014	185	11.0%	3,762	34.6%	11,280	60.7%	19,118
	2015	193	10.9%	3,719	34.9%	11,368	60.8%	19,150
	2016	200	10.8%	3,710	35.5%	11,545	61.2%	19,266
	2017	207	10.9%	3,733	36.3%	11,812	61.8%	19,475
	2018	213	11.0%	3,781	37.3%	12,156	62.8%	19,767
Rebuilding SPR 88.7% catches from high steepness state of nature	2009	273	12.0%	4,099	34.0%	11,072	59.0%	18,583
	2010	271	11.7%	4,014	34.2%	11,150	59.8%	18,845
	2011	272	11.4%	3,905	34.3%	11,164	60.3%	18,978
	2012	277	11.0%	3,780	34.2%	11,130	60.3%	19,001
	2013	285	10.7%	3,654	34.0%	11,079	60.2%	18,951
	2014	293	10.3%	3,542	34.0%	11,055	60.0%	18,891
	2015	300	10.1%	3,459	34.1%	11,100	59.9%	18,880
	2016	307	9.9%	3,408	34.5%	11,235	60.2%	18,953
	2017	313	9.9%	3,389	35.2%	11,461	60.7%	19,122
	2018	319	9.9%	3,394	36.1%	11,763	61.5%	19,374
Status quo (catch = 44 mt)	2009	44	12.0%	4,099	34.0%	11,072	59.0%	18,583
	2010	44	12.0%	4,104	34.5%	11,241	60.1%	18,937
	2011	44	11.9%	4,088	34.9%	11,349	60.8%	19,166
	2012	44	11.8%	4,057	35.0%	11,411	61.2%	19,285
	2013	44	11.7%	4,024	35.2%	11,456	61.4%	19,334
	2014	44	11.7%	4,005	35.4%	11,529	61.5%	19,371
	2015	44	11.7%	4,018	35.8%	11,673	61.8%	19,459
	2016	44	11.9%	4,069	36.6%	11,911	62.3%	19,635
	2017	44	12.1%	4,157	37.6%	12,244	63.2%	19,908
	2018	44	12.5%	4,277	38.9%	12,660	64.3%	20,268

Research and data needs

Progress on a number of research topics would substantially improve the ability of this assessment to reliably and precisely model canary rockfish population dynamics in the future and provide better monitoring of progress toward rebuilding:

1. Expanded Assessment Region: Given the high occurrence of canary rockfish close to the US-Canada border, a joint US-Canada assessment should be considered in the future.
2. Many assessments are deriving historical catch by applying various ratios to the total rockfish catch prior to the period when most species were delineated. A comprehensive historical catch reconstruction for all rockfish species is needed, to compile a best estimated catch series that accounts for all the catch and makes sense for the entire group.
3. Habitat relationships: The historical and current relationship between canary rockfish distribution and habitat features should be investigated to provide more precise estimates of abundance from the surveys, and to guide survey augmentations that could better track rebuilding through targeted application of newly developed survey technologies. Such studies could also assist determining the possibility of dome-shaped selectivity, aid in evaluation of spatial structure and the use of fleets to capture geographically-based patterns in stock characteristics.
4. Meta-population model: The spatial patterns show patchiness in the occurrence of large vs. small canary; reduced occurrence of large/old canary south of San Francisco; and concentrations of canary rockfish near the US-Canada border. The feasibility of a meta-population model that has linked regional sub-populations should be explored as a more accurate characterization of the coast-wide population's structure. Tagging of other direct information on adult movement will be essential to this effort.
5. Increased computational power and/or efficiency is required to move toward fully Bayesian approaches that may better integrate over both parameter and model uncertainty.
6. Additional exploration of surface ages from the late 1970s and inclusion into or comparison with the assessment model, or re-aging of the otoliths could improve the information regarding that time period when the stock underwent the most dramatic decline. Auxiliary biological data collected by ODFW from recreational catches and hook-and-line projects may also increase the performance of the assessment model in accurately estimating recent trends and stock size.
7. Due to inconsistencies between studies and scarcity of appropriate data, new data is needed on both the maturity and fecundity relationships for canary rockfish.
8. Re-evaluation of the pre-recruit index as a predictor of recent year class strength should be ongoing as future assessments generate a longer series of well-estimated recent recruitments to compare with the coast-wide survey index.
9. Meta-analysis or other summary of the degree of recruitment variability and the relative steepness for other rockfish and groundfish stocks should be ongoing, as this information is likely to be very important for model results (as it is here) in the foreseeable future.

Rebuilding projections

The rebuilding projections will be presented in a separate document after the assessment has been reviewed in September 2007.

Table h. Summary of recent trends in estimated canary rockfish exploitation and stock levels from the base case model; all values reported at the beginning of the year.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Commercial landings (mt)[1]	1,182.4	665.7	60.6	42.8	48.6	8.5	10.7	10.9	8.2	NA
Total catch (mt)	1,494.2	898.0	208.4	133.6	106.8	51.0	46.5	51.4	47.1	NA
ABC (mt)	1,045[2]	1,045[2]	287	228	228	272	256	270	279	172
OY	1,045[2]	857[2]	200	93	93	44	47.3	46.8	47.0	44
SPR	33.2%	48.9%	84.0%	89.7%	92.2%	95.4%	96.3%	96.3%	96.5%	NA
Exploitation rate (catch/age 5+ biomass)	0.0873	0.0506	0.0112	0.0067	0.0050	0.0023	0.0020	0.0021	0.0019	NA
Age 5+ biomass (mt)	17,125	17,733	18,659	20,078	21,275	22,333	23,583	24,402	25,317	25,995
Spawning biomass (mt)	5,499	5,826	6,364	7,149	7,910	8,603	9,226	9,749	10,183	10,544
~95% Confidence interval	4,177-6,820	4,296-7,357	4,618-8,111	5,190-9,109	5,750-10,070	6,264-10,942	6,736-11,715	7,140-12,359	7,482-12,884	7,776-13,312
Range of states of nature	2,761-8,241	2,610-9,073	2,644-10,144	2,918-11,477	3,184-12,779	3,417-13,985	3,628-15,076	3,795-16,019	3,918-16,825	4,009-17,519
Recruitment (1000s)	1,391	2,449	1,099	2,061	1,432	955	1,565	1,182	1,144	2,807
~95% Confidence interval	841-2,299	1,606-3,735	638-1,893	1,359-3,124	905-2,267	547-1,667	854-2,869	627-2,231	548-2,389	1,078-7,313
Range of states of nature	484-2,453	841-4,318	351-1,938	643-3,613	447-2,383	302-1,515	520-2,373	390-1,771	367-1,699	991-3,745
Depletion	16.9%	17.9%	19.5%	22.0%	24.3%	26.4%	28.3%	29.9%	31.3%	32.4%
~95% Confidence interval	NA	NA	NA	NA	NA	NA	NA	NA	23.1-9.4	24.1-40.7
Range of states of nature	8.1-26.2	7.6-28.8	7.7-32.2	8.5-36.4	9.3-40.6	10.0-44.4	10.6-47.9	11.1-50.9	11.4-53.4	11.7-55.6

[1]Excludes all at-sea whiting, recreational and research catches.
[2]Includes the Columbia and Vancouver INPFC areas only.

Table i. Summary of canary rockfish reference points from the base case model. Values are based on 1994-1998 fishery selectivity and allocation to better approximate the performance of a targeted fishery rather than a bycatch-only scenario.

Quantity	Estimate	~95% Confidence interval	Range of states of nature
Unfished spawning stock biomass (SB_0, mt)	32,561	30,594-34,528	34,262-31,498
Unfished 5+ biomass (mt)	86,036	NA	91,980-82,744
Unfished recruitment (R_0, thousands)	4,210	3,961-4,458	4,540-4,035
Reference points based on $SB_{40\%}$			
MSY Proxy Spawning Stock Biomass ($SB_{40\%}$)	13,024	12,237-13,811	12,599-13704.7
SPR resulting in $SB_{40\%}$ ($SPR_{SB40\%}$)	54.4%	54.4-54.4	45.8-68.5
Exploitation rate resulting in $SB_{40\%}$	0.0457	NA	0.0277-0.0600
Yield with $SPR_{SB40\%}$ at $SB_{40\%}$ (mt)	1,574	1,477-1,672	996-2,034
Reference points based on SPR proxy for MSY			
Spawning Stock Biomass at SPR (SB_{SPR})(mt)	11,161	10,487-11,835	1,654-14,053
$SPR_{MSY\text{-}proxy}$	50.0%	NA	NA
Exploitation rate corresponding to SPR	0.0528	NA	0.0524-0.0539
Yield with $SPR_{MSY\text{-}proxy}$ at SB_{SPR} (mt)	1,572	1,476-1,668	238-1,962
Reference points based on estimated MSY values			
Spawning Stock Biomass at *MSY* (SB_{MSY}) (mt)	12,211	11,529-12,893	9,524-15,042
SPR_{MSY}	52.5%	52.1-52.8	37.0-70.5
Exploitation Rate corresponding to SPR_{MSY}	0.0487	NA	0.0254-0.0794
MSY (mt)	1,578	1,481-1,675	1,002-2,104

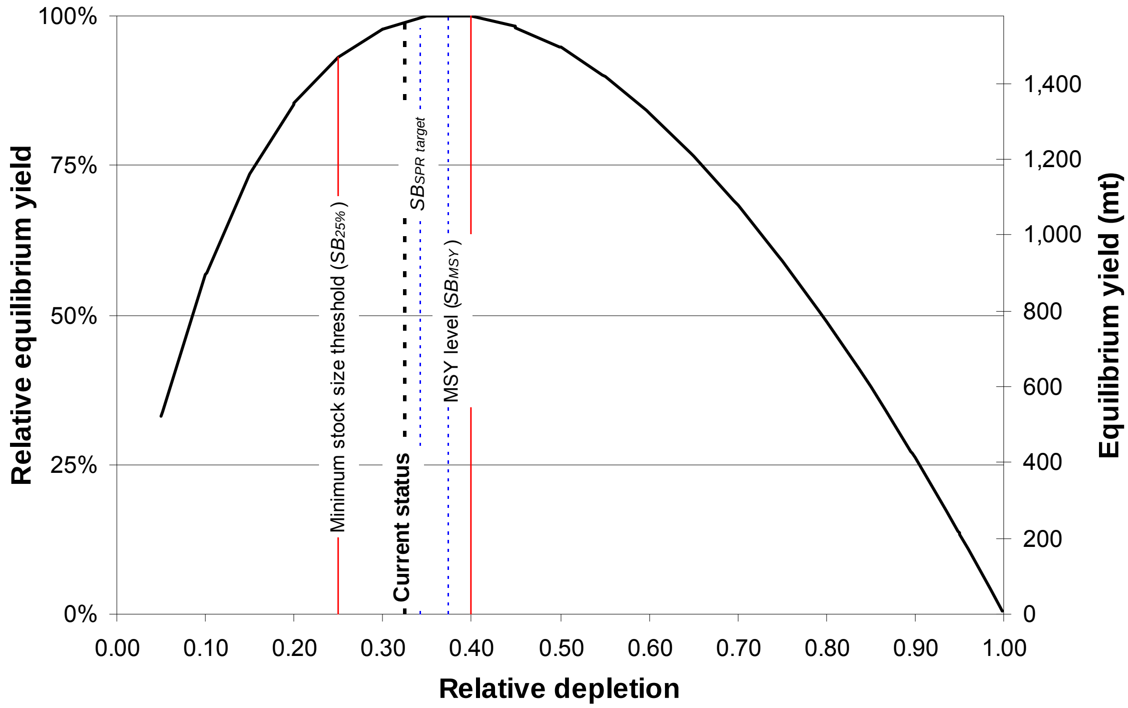


Figure h. Equilibrium yield curve (derived from reference point values reported in table i) for the base case model. Values are based on 1994-1998 fishery selectivity and allocation to better approximate the performance of a targeted fishery rather than a bycatch-only scenario.

Agenda Item F.2.a
Attachment 3
June 2008

DRAFT
SSC TERMS OF REFERENCE FOR GROUNDFISH REBUILDING ANALYSIS

DRAFT REVISED VERSION
(MAY 2008)

PACIFIC FISHERY MANAGEMENT COUNCIL
7700 NE AMBASSADOR PLACE, SUITE 101
PORTLAND, OR 97220
(503) 820-2280
(866) 806-7204
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Note: This version of the Terms of Reference does not include any changes that might be needed owing to the implementation of ACLs, as how ACLs will be implemented is currently not known.

Table of Comments

1. Introduction

Amendment 11 to the Groundfish Fishery Management Plan (FMP) established a harvest control rule for determining optimum yields (OYs). The 40:10 policy was designed to prevent stocks from falling into an overfished condition. Part of the amendment established a default overfished threshold equal to 25% of the unexploited population size[1] (B_0), or 50% of B_{MSY}, if known. By definition, groundfish stocks falling below that level are designated to be in an overfished state ($B_{25\%} = 0.25 \times B_0$[2]). To prevent stocks from deteriorating to that point, the policy specified a precautionary threshold equivalent to 40% of B_0. The policy requires that OY, when expressed as a fraction of the allowable biological catch (ABC), be progressively reduced at stock sizes less than $B_{40\%}$. Because of this linkage, $B_{40\%}$ has sometimes been interpreted to be a proxy measure of B_{MSY}, i.e., the stock biomass that results when a stock is fished at F_{MSY}. In fact, theoretical results support the view that a robust biomass-based harvesting strategy would be to maintain stock size at about 40% of the unfished level (Clark 1991, 2002). In the absence of a credible estimate of B_{MSY}, which can be very difficult to estimate (MacCall and Ralston 2002), $B_{40\%}$ is a suitable proxy to use as a rebuilding target.

Under the Magnuson-Stevens Act (MSA), it is required that rebuilding plans need to be developed for stocks that have been designated to be in an overfished state. Amendment 12 of the Groundfish FMP provided a framework within which rebuilding plans for overfished groundfish resources could be established. Amendment 12 was challenged in Federal District Court and found not to comply with the requirements of the MSA because rebuilding plans did not take the form of an FMP, FMP amendment, or regulation. In response to this finding, the Council developed Amendment 16-1 to the Groundfish FMP which covered three issues, one of which was the form and content of rebuilding plans.

The Council approach to rebuilding depleted groundfish species, as described in rebuilding plans, was re-evaluated and adjusted under Amendment 16-4 in 2006 so they would be consistent with a recent opinion rendered by the Ninth Circuit Court of Appeals in *Natural Resources Defense Council, Inc. and Oceana, Inc.* v. *National Marine Fisheries Service, et al.*, 421 F.3d 872 (9th Cir. 2005), and with National Standard 1 of the MSA. The court affirmed the MSA mandate that rebuilding periods "be as short as possible, taking into account the status and

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[1] The absolute abundance of the mature portion of a stock is loosely referred to here in a variety of ways, including: population size, stock biomass, stock size, spawning stock size, spawning biomass, spawning output; i.e., the language used in this document is sometimes inconsistent and/or imprecise. However, the best fundamental measure of population abundance to use when establishing a relationship with recruitment is spawning output, defined as the total annual output of eggs (or larvae in the case of live-bearing species), accounting for material effects (if these are known). Although spawning biomass is often used as a surrogate measure of spawning output, for a variety of reasons a non-linear relationship often exists between these two quantities (Rothschild and Fogarty 1989; Marshall *et al*. 1998). Spawning output should, therefore, be used to measure the size of the mature stock when possible.

[2] Estimates of stock status are typically obtained by fitting statistical models of stock dynamics to survey and fishery data. In recent years, the bulk of stock status determinations have been based on Stock Synthesis II, an age- and size-structured population dynamics model (Methot 2005, 2007). Stock assessment models can be fitted using Maximum Likelihood or Bayesian methods. For both types of estimation methods, a stock is considered to be in an overfished state if the best point estimate of stock size is less than 25% of unfished stock size. This corresponds to the maximum likelihood estimate for estimation methods based on Maximum Likelihood methods, to the maximum of the posterior distribution (MPD) for estimation methods in which penalties are added to the likelihood function, and to the mode of the posterior distribution for Bayesian analyses.

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" (Section 304(e)). The court opinion also recognized that some harvest of overfished species could be accommodated under rebuilding plans to avoid disastrous economic impacts to West Coast fishing communities dependent on groundfish fishing. This harvest can only be incidental and unavoidable in fisheries targeting healthy stocks and, under Amendment 16-4 rebuilding plans, more emphasis was placed on shorter rebuilding times and the trade-off between rebuilding periods and associated socioeconomic effects.

Rebuilding Plans include several components, one of which is a rebuilding analysis. Simply put, a rebuilding analysis involves projecting the status of the overfished resource into the future under a variety of alternative harvest strategies to determine the probability of recovery to B_{MSY} (or its proxy $B_{40\%}$) within a pre-specified time-frame.

2. Overview of the Calculations Involved in a Rebuilding Analysis

This document presents guidelines for conducting a basic groundfish rebuilding analysis that meets the minimum requirements that have been established by the Council's Scientific and Statistical Committee (SSC), those of Amendment 16-1 of the Groundfish FMP, and those arising from the 9th Circuit Court decision. It also outlines the appropriate documentation that a rebuilding analysis needs to include. These basic calculations and reporting requirements are essential elements in all rebuilding analyses to provide a standard set of base-case computations, which can then be used to compare and standardize rebuilding analyses among stocks. The steps when conducting a rebuilding analysis are:

1. Estimation of B_0 (and hence B_{MSY} or its proxy).
2. Selection of a method to generate future recruitment.
3. Specification of the mean generation time.
4. Calculation of the minimum possible rebuilding time, T_{MIN}.
5. Identification and analysis of alternative harvest strategies and rebuilding times.

The specifications in this document have been implemented in a computer package developed by Dr André Punt (University of Washington). This package can be used to perform rebuilding analyses for routine situations. However, the SSC encourages analysts to explore alternative calculations and projections that may more accurately capture uncertainties in stock rebuilding than the standards identified in this document, and which may better represent stock-specific concerns. In the event of a discrepancy between the generic calculations presented here and a stock-specific result developed by an individual analyst, the SSC groundfish subcommittee will review the issue and recommend which results to use.

The SSC also encourages explicit consideration of uncertainty in projections of stock rebuilding, including comparisons of alternative states of nature using decision tables to quantify the impact of model uncertainty (see Section 8 below).

3. Estimation of B_0

B_0, defined as mean unexploited spawning output, can be estimated from the fit of some form of spawner-recruit model or empirically using the estimates of recruitment from the stock assessment. Most of the recent assessments of west coast groundfish have been based on stock assessments that integrate the estimation of the spawner-recruit model with the estimation of other population dynamic parameters. These stock assessments therefore link the recruitments for the early years of the assessment period with the average recruitment corresponding to B_0. Estimates of B_0 from empirical methods will not be the same as those estimated as an embedded parameter within an assessment model. As a result, the estimate of B_0 from the stock assessment model should be the default for the B_0 used in rebuilding analyses when the stock assessment integrates the spawner-recruit model. Justification for the use an empirical estimate of B_0 is therefore needed when a direct estimate of B_0 is available from a stock assessment model, and the difference in B_0 estimates must also be documented. Stock assessment models which integrate the estimation of the spawner-recruit model also provide estimates of B_{MSY}. However, at this time, the SSC recommends that these estimates not be used as the target for rebuilding. Rather, the rebuilding target should be taken to be $0.4B_0$ in all cases.

For the purpose of estimating B_0 empirically, analysts should select a sequence of years, within which recruitment is believed to be reasonably representative of the natality from an unfished stock. The average recruitment for these years can then be multiplied by the spawning output-per-recruit in an unfished state (which depends on growth, maturity, fecundity and natural mortality) to estimate equilibrium unfished spawning output. In selecting the appropriate sequence of years, analysts have generally utilized years in which stock size was relatively large, in recognition of the paradigm that groundfish recruitment is positively correlated with spawning stock size (Myers and Barrowman 1996). Moreover, due to the temporal history of exploitation in the West Coast groundfish fishery (see Williams 2002), this has typically led to consideration of the early years from an assessment model[3]. Thus, for example, in the case of widow rockfish, the time period within which recruitments were selected when estimating B_0 was 1958-62 (He *et al*. 2003).

An alternative view of the recruitment process is that it depends to a much greater degree on the environment than on adult stock size. For example, the decadal-scale regime shift that occurred in 1977 (Trenberth and Hurrell 1994) is known to have strongly affected ecosystem productivity and function in both the California Current and the northeast Pacific Ocean (Roemmich and McGowan 1995; MacCall 1996; Francis *et al*. 1998; Hare *et al*. 1999). With the warming that ensued, West Coast rockfish recruitment appears to have been adversely affected (Ainley *et al*. 1993; Ralston and Howard 1995). Thus, if recruitment was environmentally forced, it would be more sensible to use the full time series of recruitments from the stock assessment model to estimate B_0. These two explanatory factors are highly confounded for West Coast groundfish, i.e., generally high biomass/favourable conditions prior to 1980 and low biomass/unfavourable

[3] Individual recruitments estimated from age-structured stock assessment models do not all exhibit the same precision or accuracy. Recruitments estimated at the very beginning of the modeled time period may suffer from mis-specification of the initial condition of the population (e.g., an assumed equilibrium age structure). Likewise, recruitments estimated at the end of the sequence may be imprecise due to partial recruitment of recent year classes. Thus, it may be advisable to trim the beginning and/or ending year-classes to address this problem

conditions combined with increasing fishing impacts on groundfish stocks thereafter. Using all recruitments to estimate B_0 will therefore usually result in a lower value of B_0 (and hence target spawning output) than when an abbreviated series of recruitments is taken from early in the time series.

There is no incontrovertible evidence to favour one of these two hypotheses over the other. For example, both theoretical and observational considerations support the view that groundfish recruitment will decline with spawning output (e.g., Myers and Barrowman 1996; Brodziak *et al*. 2001). On the other hand, recent advances in our understanding of the North Pacific Ocean indicate that profound changes have occurred in the marine ecosystem since the turn of the last century (PICES 2005). In fact, an argument can be made that the effects of environmental and density-dependent factors on the spawner-recruit relationship are additive (e.g., Jacobson and MacCall 1995), which may allow us to quantitatively determine the relative importance of these two factors in the future.

For each of these two empirical methods of estimating B_0, the actual distribution for B_0 can be approximated by re-sampling recruitments, from which the probability of observing any particular stock biomass can be obtained. This approach was taken in the original bocaccio rebuilding analysis (MacCall 1999), where it was concluded that the first year biomass was unlikely to have occurred if the entire sequence of recruitments were used to determine B_0.

4. Selection of a Method to Generate Future Recruitment

On can project the population forward once the method for generating future recruitment has been specified, given the current state of the population from the most recent stock assessment (terminal year estimates of numbers at age and their variances) and the rebuilding target. There are several ways of generating future recruitment, but they fundamentally reduce to two basic kinds of approaches. These are: (1) base future recruitments on an empirical evaluation of spawner-recruit estimates and (2) use the results of a fitted spawner-recruit model (e.g., the Beverton-Holt or Ricker curves). To date, rebuilding analyses have been conducted using both approaches, and both are acceptable, as long as due consideration is given to the advantages and disadvantages of both. Ideally, reference points (e.g., B_0, B_{MSY} and F_{MSY}) and the results from projections should be compared to better assess the actual extent of uncertainty associated with these quantities.

4.1 Fitting a Spawner-Recruit Model

It is possible generate future recruitments by fitting spawner-recruit models to the full time series of spawner-recruit data. SS2-based assessments all assume a structural spawner-recruit model, either estimating or pre-specifying the steepness of the curve[4]. Ideally, the use of spawner-recruit models allows the data (or prior information) to determine the extent of compensation rather than assuming either one of two extremes (constant recruitment or constant recruits/spawner), and is also more internally consistent if the original assessment assumed a particular form of spawner-

[4] The “steepness” of a spawner-recruit curve is related to the slope at the origin and is a measure of a stock’s productive capacity. It is expressed as the proportion of virgin recruitment that is produced by the stock when reduced to $B_{20\%}$, and ranges between 0.2 and 1.0.

recruit model. However, this approach can be criticized because stock productivity is constrained to behave in a pre-specified manner according to the particular spawner-recruit model chosen, and there are different models to choose from, including the Beverton-Holt and Ricker formulations. These two models can produce very different reference points, but are seldom distinguishable statistically. Moreover, there are statistical issues when a spawner-recruit model is estimated after the assessment is conducted, including: (1) time-series bias (Walters 1985), (2) the "errors in variables problem" (Walters and Ludwig 1981), and (3) non-homogeneous variance and small sample bias (MacCall and Ralston 2002). Thus, analyses based on a spawner-recruit model should include a discussion of the rationale for the selection of the spawner-recruit model used (e.g. estimated within the assessment model, estimated outside of the model based on the estimates of spawning output and recruitment), and refer to the estimation problems highlighted above and whether they are likely to be relevant and substantial for the case under consideration. A rationale for the choice of spawner-recruit model should also be provided. In situations where steepness is based on a spawner-recruit meta-analysis (e.g., Dorn 2002), the reliability of the resulting relationship should be discussed.

4.2 Empirical Approaches

There are two ways to use empirical estimates of recruitment from a stock assessment to generate future recruitment, both of which utilize estimates at the tail end of the time series (i.e., the most recent estimates). These two methods have formed the basis of several rebuilding analyses that have been accepted by the SSC.

(1) Recent recruitment is standardized to the amount of the spawning output (recruits-per-spawner, R/S_i). Annual R/S_i is then randomly re-sampled and multiplied by S_i to obtain year-specific stochastic values of R_i.

(2) Recent recruitments are randomly re-sampled to determine the year-specific stochastic values of R_i.

Note that use of R/S_i as the basis for projecting the population forward ties recruitment values in a directly proportional manner to spawning output; if spawning output doubles, resulting recruitment will also double, all other things being equal. As the stock rebuilds, this becomes an increasingly untenable assumption because there is no reduction in reproductive success at very high stock sizes, which is to say there is no compensation (i.e., steepness = 0.2). In contrast, re-sampling R_i values, results in errors in the opposite direction. Namely, recruitment does not increase as stock size increases as would be expected of most rebuilding stocks. This type of calculation effectively implies perfect compensation (i.e., steepness = 1). Thus, these two ways of projecting the population forward (using re-sampled R_i or re-sampled R/S_i) bracket the range of population responses that are likely to occur in the real world. The method selected to generate future recruitment should ensure that potential recruitment values are consistent with stock sizes between the current level and the rebuilding target, i.e., they would be considered plausible throughout the duration of rebuilding projection.

5. Determination of the Minimum and Maximum Times to Recovery

The minimum time to recovery (denoted T_{MIN}) is defined as the median time for a stock to recover to the target stock size, starting from the time when a rebuilding plan was actually implemented (usually the year after the stock was declared overfished) to when the target level is first achieved, assuming no fishing occurs. Next, the mean generation time should be calculated as the mean age of the net maturity function. A complication that can occur in the calculation of mean generation time, as well as B_0 (see above), is when growth and/or reproduction have changed over time. In such instances, the parameters governing these biological processes should typically be fixed at their most recent, contemporary, values, as this best reflects the intent of "prevailing environmental conditions" as stated in the NMFS Guidelines for National Standard 1. Exceptions may occur if there are good reasons for an alternative specification (e.g., using growth and maturity schedules that are characteristic of a stock that is close to B_{MSY}).

Although no longer used directly in Council decision-making for overfished stocks, rebuilding analyses should report the maximum time to recovery (denoted T_{MAX}). T_{MAX} is ten years if T_{MIN} is less than 10 years. If T_{MIN} is greater than or equal to 10 years, T_{MAX} is equal to T_{MIN} plus one mean generation. Likewise, rebuilding analyses should report an estimate of the median number of years needed to rebuild to the target stock size if all future fishing mortality is eliminated from the first year for which the Council is making a decision about[5] ($T_{F=0}$). This will typically differ from T_{MIN}.

Finally, when a stock rebuilding plan has been implemented for some time and recruitments have been estimated from an assessment, it may be that explicit, year-specific estimates of recruitment are available for the earliest years of the rebuilding time period. In such instances, rebuilding forecasts should be conducted setting the recruitments from the start of the rebuilding plan to the current year based on the estimates from the most recent assessment, rather than through re-sampling methods (see above).

6. Harvest During Rebuilding

The Council is required to rebuild overfished stocks in a time period that is as short as possible, but can extend this period to take into account the needs of fishing communities. The simplest rebuilding harvest strategy to simulate and implement is a constant harvest rate or "fixed F" policy. All rebuilding analyses should, therefore, consider fixed F strategies. Other strategies are possible, including constant catch and phase-in strategies, in which catch reductions are phased-in before the OYs transition to a fixed F strategy. In these latter cases, analysts should always assess whether fishing mortality rates exceed F_{MSY} (or its proxy), as this would constitute overfishing.

Analysts should consider a broad range of policy alternatives to give the Council sufficient scope on which to base a decision. The following represent a minimum set of harvest policies that should be reported:

[5] This year will generally not be the current year, but rather the year following the current two-year cycle.

1. The spawning potential ratio[6] listed in the Rebuilding Plan in the FMP (Amendment 16-4 for the stocks that are currently overfished) [only stocks already under rebuilding plans].
2. The spawning potential ratio corresponding to the optimum yields adopted for the current year (or biennium) [only stocks already under rebuilding plans].
3. The spawning potential ratio on which the current optimum yields were based [only stocks already under rebuilding plans; this spawning potential ratio will differ from that in 2) if the stock assessment has changed substantially since the last assessment].
4. The spawning potential ratio which will rebuild the stock to the target level with 0.5 probability by the T_{TARGET} specified in the FMP [only stocks already under rebuilding plans].
5. The spawning potential ratio which will rebuild the stock to the target level with 0.5 probability by the T_{MAX} specified in the FMP [only stocks already under rebuilding plans].
6. The spawning potential ratio which will rebuild the stock to the target level with 0.5 probability by the T_{MAX} calculated using the most recent biological and fishery information.
7. The ABC and 40:10 control rules.
8. No harvest.
9. Spawning potential ratios which achieve recovery to the target level with 0.5 probability for years between $T_{\mathrm{F=0}}$ and T_{MAX}. These spawning potential ratios should be selected by calculating the median rebuilding times under the most conservative rebuilding strategy (i.e., $T_{\mathrm{F=0}}$) and the most liberal, allowable rebuilding strategy (i.e. T_{MAX}) and then selecting intermediate time intervals in even quartile increments. That is, if $T_{\mathrm{F=0}}$ is 20 years and T_{MAX} = 60 years, then the intermediate alternatives would have rebuilding times of 30, 40 and 50 years, respectively.

These polices should be implemented within the projection calculations in the year for which the Council is making a decision. For example, for assessments conducted in 2009 (using data up to 2008), the harvest decisions pertain to OYs for 2011 and 2012. In this case, the catches for 2009 and 2010 should be set to the OYs established by the Council for those years.

Many other harvest policies could be implemented by the Council, based on whatever circumstances may mitigate against a constant harvest rate approach. Consequently, analysts should be prepared to respond to requests by the Council for stock-specific projections on an individual case-by-case basis.

7. Evaluating Progress Towards Rebuilding

There are no agreed criteria for assessing the adequacy of the progress towards rebuilding for species that are designated to be in an overfished state and are under a Rebuilding Plan. The SSC currently reviews each stock on a case-by-case basis, considering the following two questions: (1) have cumulative catches during the period of rebuilding exceeded the cumulative OY that was available, and (2) what is the difference between the year in which recovery is predicted to

[6] The Spawning Potential Ratio (SPR) is a measure of the expected spawning output-per-recruit, given a particular fishing mortality rate and the stock's biological characteristics, i.e., there is a direct mapping of SPR to F (and *vice versa*). SPR can therefore be converted into a specific fishing mortality rate in order to calculate OYs.

occur under the current SPR (T_{REBUILD}) and the current adopted T_{TARGET}? If the difference between T_{REBUILD} and T_{TARGEST} is minor, progress towards rebuilding will be considered to be adequate. In contrast, if the difference between T_{REBUILD} and T_{TARGET} is major, it will be necessary to define a new T_{TARGET}. As an initial step in this direction, a new maximum time to rebuild T_{MAX}^{N} will be computed based on the specifications outlined in Section 5. Analysts will be asked to assess whether the currently adopted SPR will readily rebuild the stock before T_{MAX}^{N}.

Adequacy of progress will be evaluated when the SSC groundfish subcommittee reviews the draft rebuilding plans. Analysts should provide the information needed to address the two questions listed above. If the SSC agrees that progress is not sufficient, the draft rebuilding analysis documents will need to be updated to include T_{MAX}^{N} and the probability that the currently adopted harvest rate (SPR) will rebuild the stock before T_{MAX}^{N}.

8. Decision Analyses / Considering Uncertainty

The calculation of T_{MIN} and the evaluation of alternative harvest strategies involve projecting the population ahead taking account of uncertainty about future recruitment. There are several reasons for considering model and parameter uncertainty when conducting a rebuilding analysis. For example, if several assessment model scenarios were considered equally plausible by the assessment authors or, alternatively, one model was preferred by the assessment authors and another was preferred by the STAR Panel.

The uncertainty associated other parameters, such as the rate of natural mortality and the current age-structure of the population, can also be taken into account. This can be achieved in a variety of ways. For example, if the uncertainty relates to the parameters within one structural model, this uncertainty can be reflected by basing projections on a number of samples from a distribution which reflects this uncertainty (such as a Bayesian posterior distribution or bootstrap samples). Alternatively, projections can be conducted for each model and the results appropriately weighted when producing the final combined results if the uncertainty pertains to alternative structural models.

A decision table is an appropriate means to express the implications of uncertainty in model structure when an "integrated" approach, as outlined in the previous paragraph, is not adopted. Construction of decision tables when projections are based on a constant harvest rate policy is, however, not entirely straightforward. One way to achieve this is to conduct projections for each alternative model in turn and record the median (or mean) time-trajectory of catches. The decision table is then based on projections with a set of pre-specified time-series of catches. If probabilities were assigned to each alternative model by the assessment authors and STAR Panel, these must be reported with the decision table.

9. Documentation

It is important for analysts to document their work so that any rebuilding analysis can be repeated by an independent investigator at some point in the future. Therefore, all stock assessments and rebuilding analyses should include tables containing the specific data elements that are needed to adequately document the analysis. Clear specification of the exact assessment scenario(s) used as the basis for the rebuilding analysis is essential. Therefore, linkages with the most recent stock assessment document should be clearly delineated (e.g., through references to tables or figures). This is important because assessments often include multiple scenarios that usually have important implications with respect to stock rebuilding.

The minimum information that should be presented in a rebuilding analysis is:

- Date on which the analysis was conducted, and specifications for the software used for the analysis (including the version number), along with an example of the program's input file, ideally for the base (most likely) case. Documentation and basis for the number of simulations on which the analyses are based should also be provided. The software and data files on which the rebuilding analyses are based should archived with the stock assessment coordinator.
- Rebuilding parameters. For each alternative model, a table (see Table 1 for an example based on canary rockfish) should be produced which lists: (a) the year in which the rebuilding plan commenced, (b) the present year, (c) the first year that the evaluated harvest policy calculates OY, (d) T_{MIN}, (e) mean generation time, (f) T_{MAX}, (g) $T_{\mathrm{F=0}}$, (h) the estimate of B_0 and the target recovery level, (i) the current SPR, (j) the current $\mathrm{T}_{\mathrm{TARGET}}$ and (k) the estimate of current stock size.
- Results of harvest policy projections (see, for examples, Tables 2-5; Figures 1-3). The following information should be provided for each harvest policy evaluated: (a) the year in which recovery to the target level occurs with 0.5 probability, (b) the SPR for the first year of the projection period, (c) the probably of recovery by the current $T_{\mathrm{TARGET},}$ (d) the probably of recovery by the current T_{MAX}, (e) tables of median time-trajectories (from the present year to T_{MAX}) of: (i) spawning output relative to the target level, (ii) probability of being at or above the target level, (iii) ABC, and (iv) optimum yield. Median time-trajectories of SPR should be provided for the projection based on the 40:10 rule and any phase-in harvest policies that have been specified.
- The information needed to assess progress towards rebuilding (e.g. catches and OYs during the rebuilding period) and any additional information based on the review of adequacy of progress by the SSC (e.g. T_{MAX}^{N}).
- Median and 95% intervals for: (a) summary / exploitable biomass, (b) spawning output (in absolute terms and relative to the target level), (c) recruitment, (d) catch, (e) landings (if different from catch), (f) ABC, and (g) SPR for the actual harvest strategy selected by the Council.
- The rationale for the approach used to estimate B_0 and to generate future recruitment.
- The biological information on which the projections are based (show results for each alternative model):
    - Natural mortality rate by age and sex.
    - Individual weight by age and sex.
    - Maturity by age.
    - Fecundity by age.
    - Selectivity-at-age by sex (and fleet).
    - Population numbers (by age and sex) for the year the rebuilding plan commenced.
    - Population numbers (by age and sex) for the present year.

   - How fishing mortality was allocated to fleet for rebuilding analyses based on multiple fleets.

Notes:

- Much of the biological information will be stored in the input file for the projection software and doesn't need to be repeated unless there is good reason to do so.
- For cases in which the projections take account of uncertainty about the values for the biological parameters (e.g., using the results from bootstrapping or samples from a Bayesian posterior distribution), some measure of the central tendency of the values (e.g., the mode or median) should be provided and the individual parameter values should be archived with the stock assessment coordinator.
- Rebuilding analyses may be based on selectivity-at-age vectors constructed by combining estimates over fleets. If this is the case, the rebuilding analysis needs to document how the composite selectivity-at-age vector was constructed.

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Table 1. Summary of rebuilding reference points for canary rockfish (based on Stewart (2007)).

Parameter	Values
Year declared overfished	2000
Current year	2007
First OY year	2009
T_{MIN}	2019
Mean generation time	22
T_{MAX}	2041
$T_{F=0}$ (beginning in 2009)	2019
B_0	32,561
Rebuilding target ($B_{40\%}$)	13,024
Current SPR	0.887
Current T_{TARGET}	2063
SB_{2007}	10,544

Table 2. Results of rebuilding alternatives for canary rockfish (based on Stewart (2007)).

	Run #			
	1	2	3	4
50% prob. recovery by:	2019	2021	2035	2041
SPR_{TARGET}	100%	88.7%	62.0%	59.2%
2009 OY (mt)	0.0	155.2	636.9	700.0
2009 ABC (mt)	936.9	936.9	936.9	936.9
2010 OY (mt)	0.0	155.0	623.1	683.1
2010 ABC (mt)	941.4	935.4	916.7	914.2
Probability of recovery				
2071 (T_{MAX})	97.1%	84.6%	73.5%	70.0%
2048 (T_{MIN})	76.4%	75.0%	64.8%	56.9%
2053 ($T_{F=0}$ from 2007)	79.4%	75.3%	67.9%	61.3%
2063 (T_{TARGET})	91.4%	78.8%	72.0%	66.8%

Table 3. Probability of recovery for four rebuilding alternatives for canary rockfish (based on Stewart (2007)). Note that after 25 years the table is compressed.

	Run #			
	1	2	3	4
2007	0.250	0.250	0.250	0.250
2008	0.250	0.250	0.250	0.250
2009	0.250	0.250	0.250	0.250
2010	0.250	0.250	0.250	0.250
2011	0.250	0.250	0.250	0.250
2012	0.250	0.250	0.250	0.250
2013	0.250	0.250	0.250	0.250
2014	0.250	0.250	0.250	0.250
2015	0.250	0.250	0.250	0.250
2016	0.251	0.250	0.250	0.250
2017	0.284	0.257	0.250	0.250
2018	0.407	0.288	0.250	0.250
2019	0.550	0.366	0.250	0.250
2020	0.660	0.473	0.256	0.251
2021	0.702	0.561	0.260	0.256
2022	0.732	0.633	0.267	0.261
2023	0.742	0.681	0.279	0.267
2024	0.746	0.707	0.290	0.275
2025	0.749	0.725	0.309	0.281
2026	0.749	0.735	0.321	0.293
2027	0.749	0.742	0.341	0.300
2028	0.750	0.746	0.358	0.313
2029	0.750	0.746	0.376	0.324
2030	0.750	0.747	0.402	0.336
2031	0.750	0.749	0.424	0.348
2041	0.750	0.750	0.586	0.500
2051	0.781	0.751	0.671	0.601
2061	0.895	0.776	0.714	0.660
2071	0.971	0.846	0.735	0.700

Table 4. Median spawning biomass (mt) for four rebuilding alternatives for canary rockfish (based on Stewart (2007)). Note that after 25 years the table is compressed.

	Run #			
	1	2	3	4
2007	10,544	10,544	10,544	10,544
2008	10,841	10,841	10,841	10,841
2009	11,073	11,073	11,073	11,073
2010	11,258	11,197	11,010	10,985
2011	11,383	11,260	10,880	10,831
2012	11,463	11,274	10,701	10,627
2013	11,524	11,268	10,501	10,403
2014	11,607	11,280	10,318	10,197
2015	11,751	11,351	10,186	10,041
2016	11,987	11,508	10,133	9,964
2017	12,328	11,765	10,163	9,969
2018	12,738	12,089	10,251	10,029
2019	13,181	12,432	10,357	10,113
2020	13,685	12,838	10,520	10,247
2021	14,236	13,293	10,721	10,419
2022	14,773	13,731	10,909	10,583
2023	15,350	14,210	11,130	10,775
2024	15,941	14,674	11,345	10,966
2025	16,500	15,133	11,515	11,105
2026	17,015	15,536	11,679	11,251
2027	17,517	15,959	11,852	11,391
2028	18,045	16,348	11,999	11,515
2029	18,600	16,811	12,211	11,699
2030	19,093	17,183	12,329	11,799
2031	19,528	17,519	12,432	11,877
2041	23,511	20,635	13,491	12,751
2051	26,282	22,743	14,238	13,357
2061	27,862	24,058	14,655	13,689
2071	28,903	24,832	15,097	14,073

Table 5. Median catches (mt) for four rebuilding alternatives for canary rockfish (based on Stewart (2007)). Note that after 25 years the table is compressed.

	Run #			
	1	2	3	4
2007	0.0	44.0	44.0	44.0
2008	0.0	44.0	44.0	44.0
2009	0.0	155.2	636.9	700.0
2010	0.0	155.0	623.1	683.1
2011	0.0	157.5	621.9	680.2
2012	0.0	163.7	635.4	693.4
2013	0.0	171.5	654.9	713.1
2014	0.0	179.7	675.9	734.4
2015	0.0	186.9	691.6	750.1
2016	0.0	193.4	705.3	763.1
2017	0.0	198.7	713.8	770.8
2018	0.0	205.1	724.3	780.5
2019	0.0	210.6	733.9	789.5
2020	0.0	216.8	744.3	798.9
2021	0.0	222.0	753.8	807.8
2022	0.0	228.3	765.2	818.8
2023	0.0	234.0	769.3	821.3
2024	0.0	239.0	778.8	830.7
2025	0.0	245.3	786.9	837.4
2026	0.0	250.0	795.2	845.3
2027	0.0	257.0	807.6	856.9
2028	0.0	261.7	814.0	862.9
2029	0.0	267.3	821.5	868.6
2030	0.0	272.3	830.5	877.2
2031	0.0	276.5	836.3	882.5
2041	0.0	318.0	897.1	938.2
2051	0.0	346.9	937.3	972.9
2061	0.0	365.2	967.1	1,002.9
2071	0.0	377.7	985.9	1,019.3

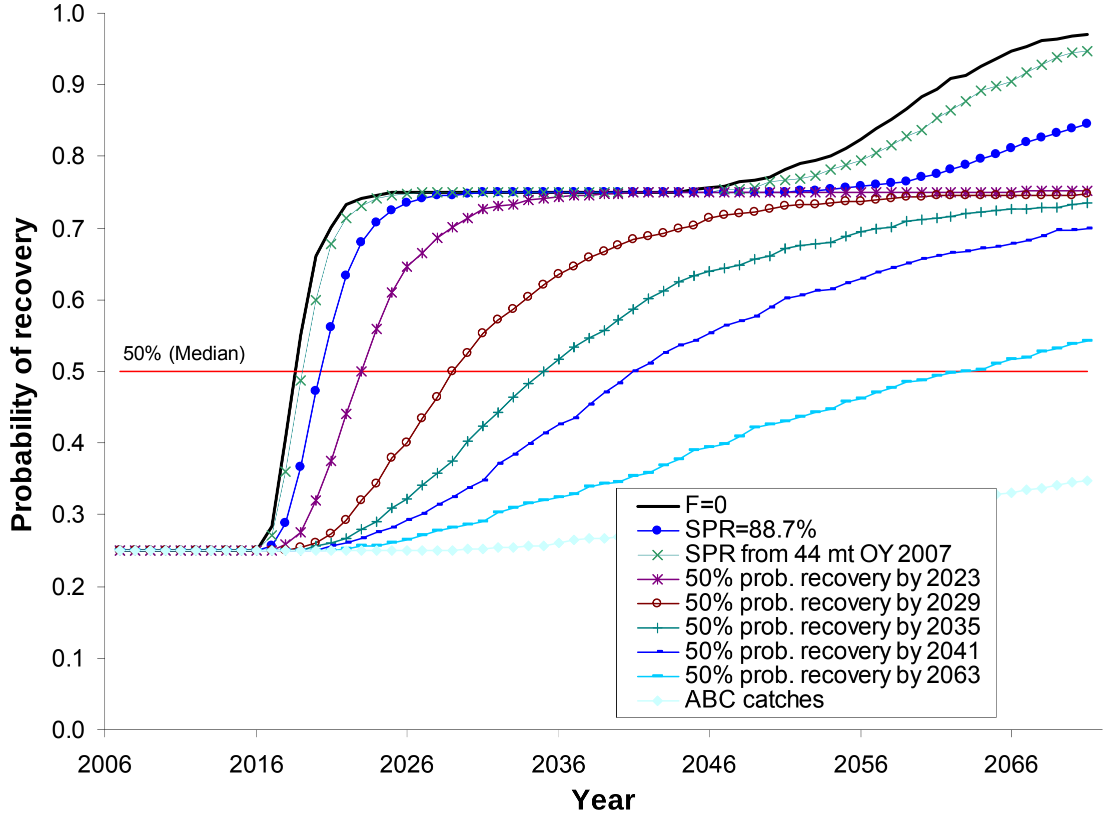

Figure 1. Probability of recovery for nine rebuilding alternatives for canary rockfish.

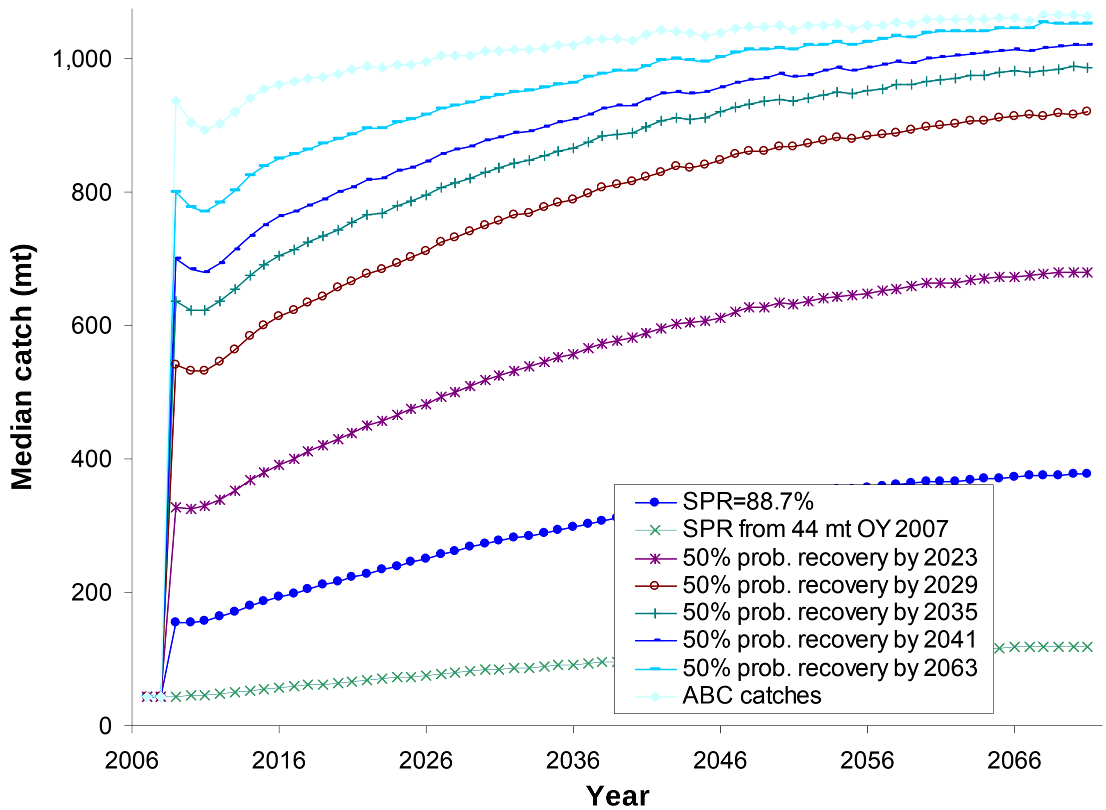

Figure 2. Projected median catch (mt) for nine rebuilding alternatives for canary rockfish.

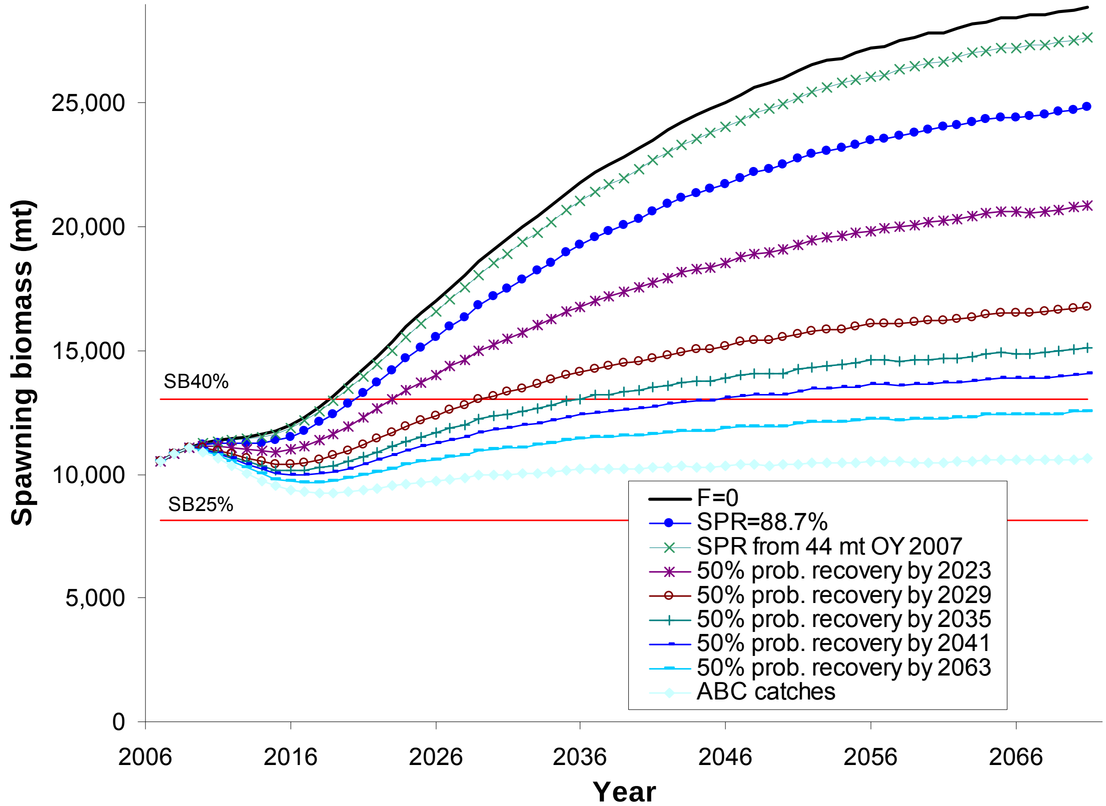

Figure 3. Projected median spawning biomass (mt) for nine rebuilding alternatives for canary rockfish.

NMFS recommendations for 2009 assessments

Full Assessments	Lead	Updated Assessments	Lead
Previously assessed species			
P. hake (Whiting)	NW		
Bocaccio rockfish	SW	Canary rockfish	NW
Widow rockfish	SW	Cowcod	SW
Yelloweye rockfish	NW	POP	NW
* Lingcod	NW	Darkblotched rockfish	NW
Petrale sole	NW		
Cabezon	NW / CA		
Currently unassessed species			
Spiny Dogfish	WDFW		
Bronzespotted rockfish Greenspotted rockfish	SW	Based on preliminary work, one of these will be selected for STAR review	
* Splitnose rockfish	NW		
* Greenstriped rockfish	NW		

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON STOCK ASSESSMENT PLANNING FOR 2011-2012 GROUNDFISH FISHERY DECISION MAKING

The Scientific and Statistical Committee (SSC) reviewed the proposed list of assessments for 2009, the draft terms of reference (TOR) for groundfish stock assessments, and TOR for groundfish rebuilding analysis. All three draft documents were reviewed by the SSC and adopted by the Council for public review during the March 2008 Council meeting. Since then, the SSC has reviewed and revised the TORs, and the Northwest and Southwest Fisheries Science Centers have reviewed and commented on the proposed list.

Dr. Jim Hastie (NWFSC) presented the proposed schedule for groundfish assessments in 2009. The SSC notes that splitnose, greenstriped, bronzespotted, and greenspotted rockfishes are listed as potential candidates for full assessments. It was reported that good data are available for splitnose and greenstriped rockfish, including survey and age composition data. Greenstriped rockfish is a non-targeted species and assessment results may provide good contrast to other targeted species. Also, splitnose rockfish and greenstriped rockfish are important components of the southern slope and northern shelf species complexes, respectively, and full assessments will enhance our understanding of their responses to exploitation or will serve as indicator species associated with those complexes. Therefore, the SSC concurs with the recommendation of the Science Centers that splitnose and greenstriped rockfishes be full assessments in 2009. In the case of bronzespotted and greenspotted rockfishes, it was recommended that, over the coming fall, data for these two species be evaluated for their suitability in conducting a full assessment and that the Groundfish Subcommittee will recommend to the Council in November which of these species to assign to a Stock Assessment Review (STAR) Panel (i.e., only one of these stocks would be fully assessed and reviewed).

The SSC recommends that the next full Pacific ocean perch assessment be conducted in 2011 because the current assessment model is stable and there is a large number of un-aged historical otoliths, which will be aged during 2010. This schedule will also allow a full assessment to be conducted during the year when the Pacific ocean perch is currently expected to be rebuilt, based on the most recent assessment. As for lingcod, the SSC recommends it to be elevated to a full assessment in 2009 due to concerns regarding differences in regional status that were evident in the last assessment.

Table 1 summarizes the SSC's recommendations for stock assessments to be conducted in the next cycle. The SSC anticipates that reviews of the ten full assessments for the species discussed above will be conducted by five STAR Panels, each covering two species. Members of the SSC Groundfish Subcommittee are prepared to chair and participate in these five STAR Panels as specified under the TOR. The SSC recommends that the Groundfish Subcommittee chair, Council staff, and the stock assessment coordinator at the Northwest Fisheries Science Center develop specific dates, species to be reviewed, and STAR Panel membership for the five proposed panels for consideration at the September Council meeting. In addition, depending on how the Pacific whiting stock assessment is handled next year, the SSC is prepared to assist in its review.

Table 1. Summary of SSC Recommended Stock Assessments for 2011-2012 Decision Making

	Full Assessments	**Updated Assessments**
1	Bocaccio rockfish	Pacific ocean perch
2	Widow rockfish	Canary rockfish
3	Yelloweye rockfish	Cowcod rockfish
4	Petrale sole	Darkblotched rockfish
5	Cabezon	
6	Lingcod	
7	Spiny dogfish	
8	Splitnose rockfish	
9	Greenstriped rockfish	
10	Bronzespotted rockfish or Greenspotted rockfish	
*	Pacific whiting	

The SSC next reviewed the updated TOR for groundfish stock assessments and, in response to an edit made to the document by the Council in March, the SSC emphasizes the importance of having two more reviewers than the number of assessments being reviewed. Based on the combined experience of members of the SSC and STAT teams, *n*+2 is the number of reviewers needed to adequately review full groundfish stock assessments. Thus, the SSC requests that the third full paragraph on page 6 of the TOR be replaced with the following text:

"STAR Panels will include a Chair (appointed from the SSC) and other members with experience gained from having conducted stock assessments. The total number of STAR Panel members (including the chair) should be *n*+2 (where *n* is the number of assessments being reviewed) unless extenuating circumstances preclude this. More specifically, of these other members, one should have a thorough familiarity with West Coast groundfish stock assessment practices, data sources, and modeling methods, and one should be a qualified independent reviewer, such as a reviewer from the Center for Independent Experts (CIE). In addition, individuals with a supervisory relationship with a STAT Team member are disqualified from serving on the STAR Panel. The same exclusion applies to individuals who contributed significantly to the development of an assessment. For example, a significant contribution might include the provision of input data (e.g., an index of abundance), but only if the use of the index is new and had not been subject to a previous STAR Panel review. In addition to Panel members, STAR meetings will include GMT and GAP advisors with responsibilities described in their terms of reference. STAR Panels normally meet for four full days."

The current TOR for groundfish stock assessments is not explicit about the requirements for data-poor assessments, especially in the definition of an annual catch limit (ACL). Amendments or modifications to the current TOR may be necessary after the national standard guidelines become available. The SSC also identifies the need to establish management control rules for assessments based on limited data.

Regarding the TOR for rebuilding analysis, the SSC notes that the directive that $0.4B_0$ be used to define the rebuilding target in all cases (the first paragraph on page 5, the last sentence) should be treated as a general guideline. The intent is to be consistent with the threshold used in the assessment that led to the overfished declaration.

PMFC 06/09/08

GROUNDFISH ADVISORY SUBPANEL REPORT ON STOCK ASSESSMENT PLANNING FOR 2011-2012 DECISION MAKING

The Groundfish Advisory Subpanel (GAP) discussed the proposed list of full and updated assessments for 2009. The GAP recommends adding four additional full assessments with the following priority:

1. Blue rockfish
2. Lingcod
3. Yellowtail
4. Pacific Ocean Perch (POP)

<u>Blue Rockfish</u>
Blue rockfish is becoming an increasingly constraining species south of 40 10. The GAP's understanding is that there is new data available to inform a full assessment and thus recommends including it on the list of full assessments.

<u>Lingcod</u>
Lingcod are extreme predators that may be affecting the recovery of depleted species. It is important to know the status of the lingcod population and the GAP recommends a full assessment.

<u>Yellowtail</u>
Yellowtail has not been assessed since 2000 and the GAP believes the species should be fully assessed.

<u>Pacific Ocean Perch</u>
The GAP concurs with the Northwest Science Center that POP should be fully assessed. It will have been six years since this stock was assessed.

The GAP recommends data reports not assessments for bronzespotted and greenspotted rockfish.

Lastly, as new techniques and methodologies are developed through workshops or other meetings, the GAP believes that GAP representation could be helpful to those processes and we recommend including a GAP member as an automatic action when these meetings or workshops are developed and scheduled.

PFMC
06/08/08

Public Comment by Steven Barrager Ph. D., on Stock Assessment Planning 2011-2012

I recommend that the Council develop a normative framework for making total allowable catch, stock assessment and information collection decisions. The costs and benefits of raising or lowering catch limits should be considered in the framework (preferably expressed in dollars) along with the uncertainties in fish stock assessments. In developing this approach NMFS should rely on the extensive literature and experience related to the science and engineering of decisions under uncertainty.

Such a framework would improve the Council's decisions and would provide more defensible arguments. As a welcome side benefit it would prevent many unproductive discussions about the precautionary approach. A normative quantitative framework would enable us to talk in a constructive way about how much precaution is appropriate in each situation.

Anyone interested in learning more about normative decision making should consult the vast literature on decision analysis or Steve Barrager, GAP Conservation Seat

Development of this normative framework should have a high priority. It is not currently in the Research and Data plan.

barrager@stanford.edu
June 8, 2008

Agenda Item F.3
Situation Summary
June 2008

PRELIMINARY REVIEW OF EXEMPTED FISHING PERMITS (EFPs) FOR 2009

Exempted fishing permits (EFPs) provide a process for testing innovative fishing gears and strategies to substantiate methods for prosecuting sustainable and risk-averse fishing opportunities. Applications for EFPs proposed for 2009 are provided as Agenda Item F.3.a, Attachments 1 through 6.

The first proposed EFP is designed to test a trolled longline strategy to selectively harvest abundant chilipepper rockfish off central California. The second proposed EFP, sponsored by The Nature Conservancy, Environmental Defense, the California Department of Fish and Game, and others, seeks to test hook-and-line and trap gears in central California using limited entry trawl permits purchased by The Nature Conservancy. The third EFP, sponsored by the Recreational Fishing Alliance and the Golden Gate Fishermen's Association, seeks to test the use of recreational hook-and-line gear to catch underutilized chilipepper rockfish, yellowtail rockfish, and slope rockfish on Commercial Party Fishing Vessels (CPFVs) within and seaward of the non-trawl Rockfish Conservation Area (RCA) in waters off California north of Pt. Conception. The fourth EFP, sponsored by the Oregon Chapter of the Recreational Fishing Alliance, seeks to test floated, long leader gear to selectively harvest yellowtail rockfish within the RCA in waters off Oregon. The fifth EFP, sponsored by Gerald Mikell, seeks to harvest yellowtail rockfish in a specific area within the non-trawl RCA north of Pt. St. George, California. The sixth EFP, sponsored by the Recreational Fishing Alliance and the Golden Gate Fishermen's Association, seeks to selectively harvest federally managed flatfish on CPFVs within and seaward of the non-trawl RCA in waters off California north of Pt. Conception.

Under this agenda item, the Council will review these EFP applications, consider public and advisory body comments, and consider moving the 2009 EFP applications forward for public review. Any recommended modifications to these EFP applications will be communicated to the EFP sponsors and the public. The Council is scheduled to decide their final recommendations for 2009 EFPs at the November meeting in San Diego, California.

Council Action:

Consider EFP applications for 2009 and provide preliminary recommendations for public review.

Reference Materials:

1. Agenda Item F.3.a, Attachment 1: Application for an Exempted Fishing Permit sponsored by Steve Fosmark entitled, "Evaluation of an epibenthic trolled longline to selectively catch chilipepper rockfish (Sebastes goodei)."
2. Agenda Item F.3.a, Attachment 2: Application for Issuance of an Exempted Fishing Permit (EFP) to Fish Trawl Permits with Longline, Trap, Pot, and Hook-and-line Gear in a Community Based Fishing Association off the Central California Coast.

3. Agenda Item F.3.a, Attachment 3: Application for an Exempted Fishing Permit sponsored by the Recreational Fishing Alliance and the Golden Gate Fishermen's Association Entitled, "Recreational Rockfish Catch Composition in the Rockfish Conservation Area Using Gear-Based Harvest Controls."
4. Agenda Item F.3.a, Attachment 4: Application for an Exempted Fishing Permit sponsored by the Recreational Fishing Alliance Entitled, "Oregon Recreational Yellowtail Rockfish EFP."
5. Agenda Item F.3.a, Attachment 5: Application for an Exempted Fishing Permit sponsored by Gerald Mikell Entitled, "Request for Experimental Fisheries Permit (EFP) for Yellowtail Rockfish."
6. Agenda Item F.3.a, Attachment 6: Application for an Exempted Fishing Permit sponsored by the Recreational Fishing Alliance and the Golden Gate Fishermen's Association Entitled, "Recreational Flatfish Catch Composition in the Area Around and Seaward of the Rockfish Conservation Area."

Agenda Order:

a. Agenda Item Overview — John DeVore
b. Agency and Tribal Comments
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action**: Adopt Preliminary Recommendations for EFPs

PFMC
05/21/08

F V S E E A D L E R
S T E V E N F O S M A R K

Agenda Item F.3.a
Attachment 1
June 2008

May 27, 2008

Mr. Donald Hansen, Chair PFMC
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RE: EXEMPTED FISHING PERMIT – CHILIPEPPER ROCKFISH

Dear Mr. Donald Hansen:

The Pacific Council kindly approved my application to fish commercially for chilipepper rockfish using fly troll gear under an EFP in November 2007. Soon after the meeting, I became ill and was unable to fish due to the medical condition. Because my future was uncertain, I failed to arrange for an observer in a timely manner. Therefore, no trained observers were available. I write today to request your consideration for an extension of time to fish the EFP over the next two years 2009 - 2010.

May I also request your consideration of the use of cameras rather than an observer, if possible, to monitor the fishery. This fishery requires full retention and therefore all activity on deck can be observed if fish identification is possible through a scientist.

Steve Fosmark

Sincerely,

Steven Fosmark
Owner – Operator

C: Mr. Rod McInnis, NMFS
Ms. Marija Vojkovich, CDFG

3059 SHERMAN ROAD • PEBBLE BEACH, CA • 93953
PHONE: 831-373-5238 • FAX: 831-373-0123

EXEMPTED FISHING PERMIT – CHILIPEPPER ROCKFISH

Request for an exempted fishing permit (EFP).

Project Title: Evaluation of an epibenthic trolled longline to selectively catch chilipepper rockfish (*Sebastes goodei*).

Date of Application: May 21, 2008

Applicant:	Steven Fosmark PO Box 1338 Pebble Beach, CA 93953 Phone: 831-601-4074 Email: fvseeadler@aol.com	Scientist:	Kirk Lynn California Department of Fish and Game 4949 Viewridge Ave San Diego, CA 92123 Phone: 858-636-3179 Email: klynn@dfg.ca.gov

Purpose and Goals

Chilipepper rockfish stocks on the west coast are considered healthy. However, because of weak stock management, the OY for this species cannot be taken. In 2006, chilipepper landings were 39.7 mt (http://www.psmfc.org/pacfin/data/r001.p06) of a 2000 mt OY. Area closures to protect overfished rockfish species have effectively closed access to this resource. *Italics are suggestions.*

The long-term objective of this project is to describe and evaluate the effectiveness of a species-selective longline technique, which if proven effective, will allow commercial fishermen access to chilipepper rockfish, a relatively abundant species of rockfish. This fishery is constrained by the current rockfish area closures (Rockfish Conservation Areas, RCA), implemented to protect overfished rockfish species. Despite the depressed condition of some west coast groundfish stocks, there are other stocks that remain healthy. These healthier stocks could safely sustain increased harvest levels if they could be fished more cleanly and without bycatch of more depleted stocks. If stronger stocks could be targeted without increasing fishing mortality on depressed stocks, the California commercial fishing fleet would have alternative fishing opportunities that would provide some economic relief to the industry while providing the public with a highly desirable product.

The objective of the research for which we are requesting an EFP would be to establish the performance characteristics of the gear and to rigorously document the catch and bycatch when deployed in areas where chilipepper are abundant and bycatch species are not, under commercial fishing conditions. The objectives would be: 1) to test the trolled gear and fishing strategy with vertical lines and artificial flies, and 2) determine Groundfish Fishing Areas that are abundant with chilipepper rockfish, and that correspond to low densities of overfished species. The second objective may better help to answer the question of how EFP results can potentially be translated into future fleet-wide fishing opportunities.

The location, gear characteristics (number of hooks, length of mainline, etc.), species composition, size distribution, and sex ratio (of chilipepper) of each set of gear will be recorded by onboard observers.

The EFP that we are requesting would allow up to three (3) vessels. Each would be limited to a bimonthly landing as established for 2008 to fish inside the current RCA using otherwise legal open access fixed gear. It is suggested limitations same as for fixed gear, and for bocaccio and widow, etc. Possible bimonthly limits for other than bocaccio. Suggest chilipepper limitation same as either open access, or trawl.

This EFP for chilipeppers is a mid-water project and will use a test line with a couple of hooks; prospecting is useful to avoid bocaccio. Prior to setting the gear, a test set will be made with vertical gear in which the gear is set vertically. This will be with no hooks closer than 3 fm of the bottom, based on acoustic soundings, to ensure that the target species is present and to minimize the chance of encountering any of the overfished rockfish species. Line will be an off-the-bottom longline with corks attached close to line, consisting of drop line, main line, and wire attached to a reel (see Diagrams 1-3, pp. 4-5). The gear will consist of a maximum of 500-750 hooks per set. Gear consists of open access troll fly and vertical hook and line gear that is set and fished in a unique way such that the hooks sink to near, but not hard on bottom

Once the test set establishes the presence of chilipepper rockfish, the gear will be deployed as follows: the vessel moves slowly ahead as the gear is deployed. The gear remains attached to the vessel at all times. Artificial “flies” are used in lieu of bait. The mainline consists of 200-600 lb. test monofilament, and may be spooled on a hydraulic drum. One end, with buoy and weight attached in such a way that the gear does not touch the bottom is sent overboard as the boat moves slowly ahead, and the remaining gear is deployed. The weighted buoy line length is adjusted in such a way that does not have bottom contact to reduce the likelihood of bycatch and to prevent the hooks from hanging up on bottom. Hooks are spaced approximately 18-30” apart on 12” monofilament gangions (approximately 60 lb test). Hooks are tied with artificial flies, and no bait is used. This gear is reported by the fisherman to selectively catch chilipepper rockfish when properly deployed (Steve Fosmark, Moss Landing, CA, F/V SeeAdler, Phone: 831-373-5238; cell phones: 831-601-4074; or Boat 831-601-7934 email: FVSeeAdler@aol.com).

The research would be conducted off central California (36 to 37.50 degrees), at depths of approximately 80-120 fm (chilis tend to get smaller in size and schools are thinner in shallow depths), in areas with canyon edges and walls, smooth hard bottom, with no rocks (example: canyon south of Año Nuevo). This depth range is currently within the RCA established to protect overfished rockfish species.

To ensure that this experimental fishery has a minimal impact on overfished rockfish species, we will use GMT - determined caps on the fishery for the following: [*Suggested preliminary caps for overfished species*]

Widow rockfish: *GMT determined* [1,440 lb *(0.7 mt)* annual cap calculated as a maximum 3% by weight of expected chilipepper take]
Bocaccio: *GMT determined* [7,200 lb *(3.3 mt)* annual cap calculated as a maximum 15% by weight of expected chilipepper take]

Canary: *GMT* *determined* [*20 fish* annual cap]
Cowcod: *GMT* *determined* annual cap [*at least 3 fish*]
Yelloweye: *GMT* *determined* annual cap [*at least 3 fish*]
Darkblotched: *GMT* *determined* [*50 lb* bimonthly per vessel cap, *0.4mt* annual cap for all vessels]

All species will be retained. Catch of species other than the above are expected to be uncommon although some yellowtail and perhaps other rockfish may be encountered in small numbers. The above caps would apply for each vessel during the two-month cumulative period for the entire EFP and attaining the annual caps for any one species would terminate the EFP for all vessels.

Although the caps specified above are simply recommendations, which we realize may be modified, we provide the above catch levels to illustrate the maximum potential bycatch of overfished species that could be realized under these caps with the present landing limits in place. We anticipate that fishing as described in this EFP will not be constrained by these caps.

Chilipepper rockfish caught under this EFP will be retained and sold by the permitted vessel. Although we have calculated the maximum weight of overfished rockfish that could be caught under the suggested caps, we believe this fishery will not be constrained by these caps and will have a smaller bycatch than indicated above.

The initial duration of this EFP is for one year. However, if the results of this experiment are successful, we would request that the EFP be extended.

This EFP will incorporate a standardized data collection and reporting format coordinated by the California Department of Fish and Game and the NMFS Northwest Fisheries Science Center. Under the terms of this EFP, all vessels participating in this EFP fishery each will carry an observer with the cost of observer coverage borne by the EFP participants. The observer will record all fish caught and ensure that bycatch caps are not exceeded. Vessel captains will keep records of catch by species by set for all sets under this EFP. As it is possible that the catch and bycatch will change seasonally, we expect participants to fish year round (or in each month that the fishery is permitted).

The applicant and the scientist will be responsible for data analysis. Data analysis will consist of statistical analysis of catch and bycatch of all species by set, trip, and month. Catch rates will be expressed as catch per hook, per set, per day, and per trip. Value of the catch will be recorded following sale of the catch. The final report will provide an estimate of fishing effort and total catch; absolute and relative species composition summarized by set, trip, and month; size composition of catch and bycatch; and sex ratio and stage of maturity for chilipepper.

Vessels to participate in this EFP fishery will be chosen on their ability to accommodate an observer, their willingness to maintain detailed catch data and their willingness to fish during the time when fish are available.
Areas to be selected for high-density target species will be between 37.20 degrees (Pigeon Point) and 36 degrees (Point Lopez). Other areas may be selected as needed.

Equipment needed:

Hydraulic reel, 1000 feet of conveyor belting or reel with wide runner, fly-hooks, line, wire, snaps, small buoys, one large buoy, 3 and 5 lb. weights, fish finder, fathometer, or sonar.

Description:

500 to 750 hooks are needed for three or four sets in the morning and afternoon; 1,000 would be the best as the sets are limited.

Design:

Determine depth: if 90 fm deep, use 85 fm of drop line, deployed first and 5 pound weight at the end with attached long line to drop line 1 fm above weight. Buoy attached to line at surface to sustain depth. If long line is 1,000 feet, 750 leaders and hooks with small floats attached to long line between leaders. Floats have short lines and are attached to the long line with short tethers.

Time to fish is short. During the day chilipepper come off the bottom and once they are mid-water one cannot catch them by this method. Therefore the morning and evening are the best times. Otherwise sonar is needed.

<u>Diagram 1</u>.

```
BOAT                                                              O      surface buoy
     \wire                                                        / nylon line
      \          float                                            \
       \ __/___@___/______/___@__/______/___@__/______/
        / 1fm                                                      \   1 fm line
       0 … 30 lb. weight      ( line is 4 fm from bottom)           0 …. 5 lb.weight
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Line is 1,000 feet long and weight is 3 fm from bottom and 1 fm to where it attaches to provide control. The long line then is 4 fm from the bottom. When the line reacts to bites, take the boat out of gear and the line will float between floats and fish will climb the line to the floats as they do with vertical gear on up and as line is pulled, line rises to the surface. Boat must then be going ahead while pulled to keep the fish on. The tail drop line remains at 85 fathoms. As the boat moves forward the drop line moves close to the end of the boat tight and fish continue to climb the line. As the line is towed in, fish stay in area of line where school is thicker, (pull through spot of fish). As line is pulled on board it becomes vertical.

Diagram 2. Retrieved

Pulled aboard vessel the line becomes vertical. Buoy holds line and weight above floor.

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Surface________________________________________BOAT          O  buoy
                                                  \          /
                                                   \/       /
 ><((((º>`·.¸¸.·´¯`·.¸.·´¯`·...¸><((((º>¸.           \     /   nylon line
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                                                        \   /
                                                         \/
                                                          /   1 fm drop line to weight
                                                          0    5 lb.weight
                                                               4 fm, to ocean floor

Ocean floor______________       line, hooks and floats not less than 4 fm from ocean floor
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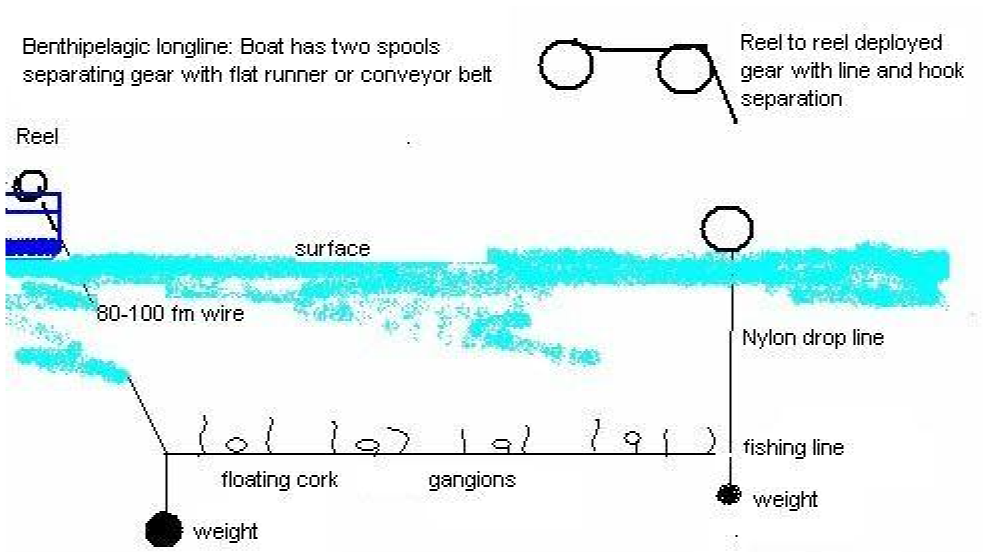

Diagram 3. Deploy: Midwater Longline Fly Fishery.

Reel to reel deployed over belt. Forward reel has coiled line gear over a conveyor belt and is deployed over stern by a powered stern reel. Conveyor belt is coiled from the forward reel over a stern reel and line spools off into water. Pull line back with powered forward reel by rolling line and conveyor belt onto forward reel. Line revolves over stern reel with belt onto forward reel, the conveyor belt is moving with it. Line is never coiled onto stern reel, only over the conveyor belt. The line always goes from water over the stern reel, and coiled back onto the forward reel. Belt acts as a protection from entanglement for gear separation. Stern reel acts as a roller to hold coiled belt.

Application for Issuance of an Exempted Fishing Permit (EFP) to Fish Trawl Permits with Longline, Trap, Pot, and Hook-and-line gear in a Community Based Fishing Association off the Central California Coast

May 21, 2008

1 Applicant contact information

California Department of Fish & Game
Contact: Marija Vojkovich and Joanna Grebel
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City of Morro Bay
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Harbor Department
1275 Embarcadero
Morro Bay, California 93442
Phone: (805) 772-6254
Fax: (805) 772-6258

Morro Bay Commercial Fishermen's Organization, Inc.
Contact: Jeremiah O'Brien, President
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Morro Bay, California 93443
Phone: (805) 441-7468

Port San Luis Harbor District
Contact: Steve McGrath, Harbor Manager
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Port San Luis Commercial Fisherman's Association
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Environmental Defense Fund
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2 Statement of purpose and goals of the experiment for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP.

This proposal requests an EFP for 2009 to allow this partnership to continue a demonstration project in Morro Bay and Port San Luis, California begun under an EFP in 2008. The partnership will provide reports to the PFMC regarding performance of the community based fishing association this year. These reports will be heavily focused on lessons learned in organizing this fishing enterprise and the first year of performance. This project builds on the foundation laid with the 2008 EFP. Extending the project to a second year of operation under an EFP in 2009 will capitalize on the decision made by PFMC in the approval of the 2008 EFP, maximize the benefits of the lessons learned, further cement relationships between environmental groups and the commercial fishing industry and will provide insight into how the fishing association will continue to operate long into the future. In addition, extension to a second year will allow us to test the ability of the community-based fishing association to adapt to changes in fishing caps resulting from changes in stock abundance and regulations. Finally, the extension would provide sufficient data and experience for the CBFA partners to decide if and how to formalize the CBFA and cooperative fishing in this area into a permanent fishing enterprise that could hold fishing privileges and oversee cooperative conservation and management activities.

While Council approval was given in November 2007, NMFS will issue the final 2008 EFP within the month, and fishing is likely to begin in early July 2008. We have identified eligible and willing participants, hired NOAA-trained observers, made progress on developing the guidelines and harvest plan that will guide implementation, and other key milestones. In addition, TNC is partnering with the WCGOP to use the EFP as a platform to test the feasibility of using electronic monitoring as a component of meeting full accountability requirements. This proposal requests an EFP for 2009 to allow this 2008 EFP partnership demonstration project in Morro Bay and Port San Luis, California that begins this summer to continue into 2009.

2.1 Purpose and Goals

We request approval by the Pacific Fisheries Management Council (PFMC) for an EFP to allow The Nature Conservancy to continue work under the EFP approved by the Council in November 2007, to employ six Limited Entry Trawl "A" permits using longline, trap, pot, and hook-and-line gear by leasing those permits to not more than six fishermen. Further, as we did last year, we request permission to use these permits under shared hard caps for target and bycatch species, not subject to existing trawl trip limits, but subject to a harvest plan that will include measures to manage the pace of the EFP fishery. These exemptions to the rules governing Limited Entry Trawl permits are necessary to conduct the EFP experiment. We are not proposing any changes in the EFP experiment, but for ease of reference, we have incorporated the same description of the experiments from the 2008 application.

This second year of the Exempted Fishing Permit (EFP) will allow us to continue test the proposition that establishing a cooperatively managed, community based fishing association that employs trawl licenses to use longline, trap, pot, and hook-and-line gear off the Central California coast, under shared hard caps for target and bycatch species, can provide several important benefits. Under the EFP, the applicants will test whether granting the option of switching from trawl gear to fixed gear types can be manageable and, perhaps, desirable within the larger groundfish fishery management structure. The EFP will also test whether forming relationships among fishermen under a cooperative structure with shared catch limits and several unique elements would mitigate the impact of trawl effort reduction or removal on associated communities and fishermen in these areas.

The applicants' hypothesis is that reduced bycatch of overfished species and higher value of target species caught by converting some trawl effort to longline, trap, pot, and hook-and-line gear will improve both the environmental and economic performance of the local groundfish fishery. Because the six trawl permits based in Morro Bay were purchased by The Nature Conservancy (TNC), and trawling effort has not been replaced in the area, the permits could be re-deployed without severe impacts on other fishermen. In addition, the EFP offers the opportunity to compare the economic performance of a fixed gear groundfish fishery under the EFP to baseline conditions during a trawl fishery operating recently in the same area.

Cooperative-based management has been identified as a tool for enhancing management and economic benefits in fisheries. The trawl fishery of the Central Coast of California provides a unique opportunity to test this idea in a real-world situation with features not found in current cooperatively-managed fisheries. These features include:

1. Multi-species fishery with several severely depressed stocks and constraining catch limits;
2. Single owner of multiple permits who can facilitate formation of a cooperative fishing arrangement;
3. Approved, economically viable, more selective alternative gear technologies available; and,
4. Possible future rationalization that could include gear switching opportunities and may include other provisions that would affect communities' ability to establish this type of fishing enterprise.

To conduct this test, TNC will be leasing up to six of its Limited Entry Trawl "A" permits, under the exemptions and requirements described in this proposal, to no more than six fishermen to fish using longline, trap, pot, and hook-and-line gear under shared hard caps for target species and bycatch. TNC will be the entity responsible for developing the lease arrangements under which fishermen will participate in this EFP and for enforcing the terms of their use, and for ensuring that implementation of this EFP is accountable to state and federal regulatory and reporting requirements.

Further, TNC is working with fishermen participating in the EFP and the Morro Bay Commercial Fishermen's Organization, the Port San Luis Commercial Fishermen's Association, the City of Morro Bay, the Port San Luis Harbor District, the Department of Fish and Game, and Environmental Defense Fund to develop the terms of the arrangement under which these fishermen will operate on a cooperative basis pursuant to the terms of the EFP. This arrangement will be referred to throughout this proposal as a "community based fishing association." In 2008, the conditions for this arrangement will be established in the terms and conditions of the lease agreements and reinforced by the terms and conditions of the EFP.

2.2 <u>Disposition of species to be harvested under the EFP</u>

Species caught within the limits authorized for the EFP may be retained and sold by the vessel. All rockfish will be retained. Prohibited species must be surrendered to law enforcement.

3 Justification for Issuance of the EFP, including potential impacts of issuing the EFP.

There are three main points that justify the issuance of this EFP through 2009:

1. It will further the goals and objectives of the Pacific Coast Groundfish Fishery Management Plan.
2. It will provide information regarding the mechanics of trawl IFQ process by providing experience with gear switching, RFA-based management, and improving monitoring efforts – all of which are or could be important elements of the trawl IFQ program.
3. It will test ways to reduce impacts on small fishing communities of the trawl IFQ program.

Furthering the Goals of the Pacific Coast Groundfish Fishery Management Plan: This EFP is designed to test the ability of a community based fishing association that uses gear-switching and shared hard caps to better achieve Pacific Coast Groundfish Fishery Management Plan (PCGFMP) goals and objectives. The goals of the PCGFMP are to prevent overfishing and rebuild overfished stocks, prevent habitat loss, maximize the value of the groundfish resource, and to provide opportunities to utilize abundant stocks to the extent possible within the constraints of overfished species rebuilding requirements. However, the current management system provides few positive incentives or opportunities for fishermen to change the way they do business to meet the PCGFMP rebuilding or habitat protection objectives. In addition, regulatory obstructions exist to fishermen being allowed the flexibility to manage their fishing operations in a way that would enhance the value of their catch while reducing their costs. By permitting the use of trawl permits with fixed gear (which will likely offer some improvements in habitat impacts and selectivity), with shared hard caps, under collective decision-making on pooled access to the resource, this EFP will test the efficacy of a community based fishing association and gear switching as mechanisms for better aligning management and fishing incentives.

Informing Trawl Rationalization: This EFP will approximate some of the conditions that could follow implementation of IFQs for the West Coast trawl fishery. Fishermen will likely be confronted with highly constrained limits on target species and bycatch of overfished species, as well as additional regulatory costs (i.e. monitoring). Fishermen may choose a number of strategies to maximize the value of their catch while staying within constraints, including switching gears (currently an option in the proposed alternatives) and pooling effort through a Regional Fishing Association (RFA, an option under the MSFCMA). An RFA could be charged with making decisions regarding deployment of fishing effort within constraints established by the Council, for determining distribution of limited human observer coverage across this fishery, and for developing strategies and incentives to achieve harvest targets while remaining below hard caps for overfished species. Managing quota under an IFQ program collectively may provide additional conservation and economic benefits, but it will be important that provisions in the IFQ regulations permit this sort of consolidation for coordinated management purposes or that regulations guiding the development of RFAs are promulgated so that communities like these can retain their traditional groundfish industries.

The trawl IFQ options currently under review call for 100% observer coverage. This EFP will similarly utilize 100% human observer coverage and will provide practical and valuable information on how a community would employ and manage observers. By acting in a coordinated manner, fishermen may be able to reduce costs while still providing required information to managers. Furthermore, the EFP will illuminate the challenges of monitoring and managing a community based fishing association in the context of the larger west coast groundfish fishery. The EFP will also provide information on costs of management under a rationalized fishery.

In addition, the EFP will provide practical experience in developing a working relationship between a community based fishing association, the PFMC, and NOAA Fisheries. Through lease agreements, The Nature Conservancy – acting for and in collaboration with the community based fishing association - will hold participants to constraints specified in the EFP, and ensure compliance with the regulatory and reporting requirements established by the PFMC the regulatory and reporting processes established by the PFMC, the State of California, and NOAA Fisheries. This will provide insights as to how community based organizations in the future might be used to assist managers in getting timely information about the fishery including members compliance with regulatory requirements.

<u>Reducing Impacts on Fishing Communities:</u> Evidence suggests that cooperative, community based fishing associations offer an opportunity to strengthen fisheries on the West Coast. Regulations to rebuild stocks and protect habitat promote fisheries sustainability and address the consequences of overcapacity, but at a very high economic and social price to fishing communities. Public perceptions about trawl fishing practices, market dislocations, increasing costs and diminishing harvest opportunities, as well as buyouts to reduce capacity have taken their toll on communities that rely on the groundfish trawl fleet. On a large scale, rationalization of the trawl fleet is likely a net benefit, but its effects on a community scale are less clear. Regionally based fishing associations could provide an opportunity for fishermen to coordinate their efforts, pool resources, and make collective investments in fishery infrastructure, in order to optimize the value of the resource, meet rebuilding and habitat conservation requirements, and preserve fishing heritage. This part of the experiment is consistent with PCGFMP objectives to provide for the sustained participation of fishing communities, and minimize adverse economic impacts.

The use of shared hard caps for target species and bycatch proposed by this EFP will allow the community based fishing association to take steps that are likely to improve the opportunity offered to fishermen and the community, including through the following means:

1. Enhancing harvest efficiency– by coordinating on harvest, members can reduce costs of harvest by sharing information, eliminating redundant effort, and reducing the incentive to stuff capital.
2. Commanding increased price – switching to longline, trap, pot, or hook-and-line gear is likely to deliver a higher quality or preferred product that may command a higher price.
3. Pooling risk – by sharing a hard cap for bycatch, the group are able to spread compliance risk across members and minimize effort associated with individual fishing operations, including the race to fish. This could enable more targeted harvesting, and has the potential to raise revenues and reduce costs.

While community based fishing associations that operate under shared caps and facilitate gear switching will likely prove to be a valuable approach in many places around the country, practical experience is extremely limited. Morro Bay and Port San Luis have many attributes that lend themselves to testing this approach:

- Extensive outreach to area fishermen has already occurred, including a survey to establish interest in leasing TNC trawl permits in order to fish them with fixed gear, and several fishermen have already requested to participate in this EFP.
- The City of Morro Bay and the Port San Luis Harbor District are sponsors of this EFP along with the Morro Bay Commercial Fishermen's Organization and the Port San Luis Commercial Fisherman's Association. Strong local support is essential to running a successful experiment.
- One of the project partners, The Nature Conservancy, purchased six limited entry trawl permits from Morro Bay fishermen, removing trawl capacity that has not been replaced by trawl fishermen from other places. This presents an opportunity to target some species without substantial negative consequences for other communities relying on the same resource.

4 Statement of whether the proposed EFP has broader significance than the applicant's individual goals.

While cooperative management has been used successfully in fisheries throughout the world, there is less knowledge about how such an approach could work on the West Coast, in a constrained multispecies fishery, within the management options created by new provisions of the MSFCMA which allow the establishment of RFAs as part of Limited Access Privilege Programs, such as IFQ programs. This EFP will provide managers with insights into how a fishing association could work to achieve PFMC/NOAA Fisheries' strategic goals for groundfish and FMP objectives; information that will be useful in development of regulations or guidelines governing establishment of RFAs pursuant to language in the Magnuson-Stevens Fishery Conservation and Management Act (Sec. 303A(c)(4)).

This project continues work that will begin under an EFP in 2008. While the partnership will provide reports to the PFMC regarding performance of the community based fishing association this year, those reports will be more heavily focused on lessons learned from trying to organize this fishing enterprise and lessons learned in the first year of performance. Extending the project to a second year of operation under an EFP in 2009 will provide greater insight into how the fishing association will operate after many startup challenges have been resolved.

Management measures related to rationalization, such as the trawl IFQ program, will require enhanced monitoring, because such programs emphasize individual accountability to catch limits. This EFP will explore how to structure a more cost-effective monitoring system - from the perspective of both fishermen and fishery managers.

5 Expected total duration of the EFP

This EFP will be valid for one year, and will allow the continuation of a demonstration project initiated under an EFP in 2008. This demonstration project is intended to lay the groundwork for a permanent fishing enterprise that could hold fishing privileges and oversee cooperative conservation and management activities.

6 Number of vessels covered under the EFP

This EFP will use 6 Limited Entry Trawl "A" permits held by The Nature Conservancy and will include no more than six fishery participants and will employ no more than six vessels.

7 A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment; this description should include harvest estimates of overfished species

This proposal requests an Exempted Fishing Permit be issued to The Nature Conservancy to grant permission to lease up to six Limited Entry Trawl "A" permits to fishermen for use with longline, trap, pot, and hook-and-line gear. Further, we request permission to use these permits under a shared hard cap and, rather than be subject to existing trawl trip limits, be subject to measures established by the fishing association to pace fishing effort throughout the year. (see section 12)

Under this EFP, TNC will lease up to six permits to a specified set of participants in the fishing association who will have the opportunity to fish up to specified hard caps of target species and bycatch species. If the fishing association is on track to exceed its bycatch cap prior to reaching its target species cap, then fishing under the EFP will end (prior to its reaching the target species hard caps).

7.1 Target species caps

For the 2008 EFP, the following species were identified, through an examination of catch histories of the six permits that are the subject of this proposal, Morro Bay ex-vessel revenue data, and interviews with Central Coast fishermen, to have been historically harvested under the six trawl permits used for this experiment and to be accessible in commercially viable amounts using gear specified in this proposal. There is one exception to this last statement – flatfish are included here in greatly reduced amounts compared to trawl landings and it is unlikely that these caps will be reached during the course of this EFP.

For the requested 2009 EFP, we propose that the list of species for which hard caps are requested remain the same as was approved by the PFMC in 2008. With regard to the hardcap numbers proposed for each species, we would develop proposed amounts for 2009 following a similar rationale to that used for establishing the 2008 levels.

<table>
<tr><th>Species:</th><th>Hard cap approved for EFP in 2008:</th><th>Hard cap requested for EFP in 2009:</th></tr>
<tr><td>Sablefish</td><td>50 mt</td><td rowspan="13">Request for target species hard caps would follow a similar rationale to that used for establishing the 2008 levels and will be subject to GMT deliberations and Council decisions regarding 2009/10 management specifications.</td></tr>
<tr><td>Southern Slope Rockfish</td><td>50 mt</td></tr>
<tr><td>Blackgill Rockfish</td><td>20 mt</td></tr>
<tr><td>Longspine thornyhead</td><td>60 mt</td></tr>
<tr><td>Shortspine thornyhead</td><td>60 mt</td></tr>
<tr><td>Lingcod</td><td>15 mt</td></tr>
<tr><td>Other:</td><td></td></tr>
<tr><td>Chilipepper rockfish</td><td>20 mt</td></tr>
<tr><td>Splitnose Rockfish</td><td>1000 lbs</td></tr>
<tr><td>Flatfish:</td><td></td></tr>
<tr><td>Dover sole</td><td>10 mt</td></tr>
<tr><td>Petrale sole</td><td>10 mt</td></tr>
<tr><td>Other flatfish</td><td>10 mt</td></tr>
</table>

The hard cap requested for sablefish was based on the catch history of the six permits purchased by The Nature Conservancy in 2006, which provides a good starting point because this trawl capacity was removed very recently from the Conception Area and has not been replaced. From 1994 to 2004, Morro Bay trawl landings represented on average 46% of Conception Area landings of sablefish. Together, when the TNC permits were active, they accounted for approximately 30% of Conception Area landings for sablefish. Average total Conception Area landings of sablefish between 1998 and 2006 were 168 metric tons. The proposed hard cap is derived by taking 30% of the average or 50 metric tons.

Hardcaps for species other than sablefish is expected to be less than the proposed hard cap figures authorized by the PFMC. These hard cap proposals are based on potential catch deemed necessary by the applicants to effectively prosecute the EFP, interest from fishermen likely to participate in catching these species, and the need to minimize negative impacts on other fishermen and areas.

7.2 Bycatch caps

In 2008, bycatch hard caps were recommended by the California Department of Fish and Game and further refined by the PFMC based on the overfished species scorecard. Recognizing the complex issues related to allocating overfished species, we propose to work with the PFMC to develop appropriate hardcaps for overfished species in 2009 based on additional information on stock status, GMT deliberations, and the development of the 2009 scorecard. The 2008 EFP hard caps may serve as a starting point for that process:

<table>
<tr><th>Species:</th><th>Hard cap approved for EFP in 2008:</th><th>Hard cap requested for EFP in 2009:</th></tr>
<tr><td>Canary Rockfish</td><td>50 lbs</td><td rowspan="7">Request for hardcaps for overfished species would be based on 2008 levels, stock status, GMT recommendations, and the 2009 scorecard.</td></tr>
<tr><td>Yelloweye Rockfish</td><td>150 lbs</td></tr>
<tr><td>Widow Rockfish</td><td>2 mt</td></tr>
<tr><td>Darkblotched Rockfish</td><td>1000 lbs</td></tr>
<tr><td>Pacific Ocean Perch</td><td>300 lbs</td></tr>
<tr><td>Cowcod</td><td>300 lbs</td></tr>
<tr><td>Bocaccio</td><td>5 mt</td></tr>
</table>

All caps will be apportioned to individual vessels within the fishing association to achieve the goals of the EFP.

8 Infrastructure to monitor, process data, and administer the EFP.

The Nature Conservancy will be the entity to which the EFP, if approved, is issued and the entity principally responsible for managing implementation of this EFP.

8.1 The Nature Conservancy will manage all fishing leases and will be responsible for enforcing the terms that govern their use. This will include working with fishermen to establish lease terms that reflect the purposes and goals of this EFP. TNC will be responsible for ensuring accountability to relevant State and Federal regulatory and legal requirements.

8.2 Data collection, analysis, and reporting will be managed by a dedicated project manager under contract to The Nature Conservancy and who works closely with a local community based fishery association committee ("the Committee") that is comprised of representatives of the sponsors of this proposal and the participants in this EFP.

8.3 The project manager's responsibilities include but are not limited to the following tasks:

- Facilitating communication among EFP participants;
- Ensuring that no vessel fishes without an observer and that observer work guidelines are complied with;
- Monitoring and enforcing compliance of vessels with rules under the EFP;
- Collecting and compiling socioeconomic and other fishery data; and,
- Preparing, in cooperation with the Committee and others, as appropriate, reports to the PFMC on progress under this EFP.

8.4 At-sea monitoring will be done by NOAA-trained observers under contract between TNC and the West Coast Groundfish Observer Program with costs covered jointly by project sponsors.

8.5 Data collection and processing for the research questions presented in the proposal will be managed as follows:

- Information regarding the operation of the community based fishing association will be compiled by the project manager working in close coordination with the participants and the Committee.
- Economic data will be collected by the project manager and analyzed by an economist under contract to The Nature Conservancy for this purpose.

8.6 A Committee has been formed that will serve as the board of the proposed community based fishing association. This Committee includes representatives from the Morro Bay Commercial Fishermen's Organization, the Port San Luis Commercial Fisherman's Association, the City of Morro Bay, the Port San Luis Harbor District, The Nature Conservancy, and Environmental Defense Fund. The Committee's responsibilities include:

- Implementing a process to choose participants including, developing the application, distributing to likely participants, screening for eligibility, and – in the event more than six eligible fishermen indicate interest – the Committee will convene an impartial selection panel to make the final determination regarding selection;
- Overseeing development of the fishing plan with participating fishermen;
- Overseeing the budget;
- Overseeing the project manager; and,
- Ensuring compliance with all EFP reporting requirements.

9 Mechanism to ensure that the harvest limits for targeted and incidental species are not exceeded and are accurately accounted

All participating vessels will be required to land fish in Morro Bay or Port San Luis. Harvest limits for each vessel will be established by the fishing association. Catch information will be monitored using observer data collected at-sea, as observers will be present on every fishing trip. Catches of rockfish will also be monitored though a dockside census of retained rockfish. All participants will enter into data sharing agreements as a condition of the lease agreement to facilitate access to fishery information and will be required to submit copies of catch information to the project manager within 48 hours after each fishing trip taken under this EFP.

Total landings and discard of all species will be accounted for by the project manager who will provide regular reports. For in-season monitoring relative to catch limits, data on catches will be collected on a by-permit basis and cumulatively for the EFP from observer data and tracked relative to hard caps, and reported every two weeks to NOAA Fisheries. The project manager will move to more frequent tracking as the EFP approaches its catch limits. All fishing will cease prior to attaining the caps associated with this EFP. Any unintentional overages will be reported to the Council as soon as possible.

Although this proposal requests an exemption from trip limits, the purposes for establishing trip limits including pacing and maintaining the fishery throughout the year, reducing discards, and protecting overfished species, are extremely important. Before fishing may commence, the fishing association will develop specific guidelines in a harvest plan that describes how fishing under the EFP will achieve these purposes.

10 Description of the proposed data collection and analysis methodology

10.1 <u>In what ways can a community-based fishing association help to meet management objectives while simultaneously improving the economics of the fishery and the fishing community?</u>

The Central Coast represents a unique set of circumstances for developing a cooperative fishing association, referred to in this project as a CBFA focused on both economic optimization and improved management performance. Historically, the majority of Morro Bay and Port San Luis fisheries' access to the groundfish resource has been through their trawl fleet. While other forms of fishing activity take place in these communities, trawlers from these areas have been responsible, for example, for up to a quarter of the sablefish harvest in the Conception Area.

Changing economics, increasing costs of doing business, and regulations have driven many fishermen who trawled to seek other options – many of them choosing to sell their permits and find other ways to earn their livings. These individual decisions have taken their toll on these communities as well. Within the prospect of rationalization of the trawl sector and individual quotas, looms the possibility that remaining access will soon move permanently to the north and access for central coast communities to the resource off their shores will be lost.

Provisions in the reauthorization of the MSFCMA provide for the creation of RFAs as a way for fishing communities to cooperate and maintain access to the resource under a quota share program. This project provides a practical opportunity to develop a fishing association that can improve the conservation performance of the fishery (particularly with regard to bycatch of depleted species), provide economic opportunity for fishermen, improve accountability to managers, and enhance community stability and other benefits from the fishery.

Following the 2008 EFP, the process of establishing a CBFA, selecting members, developing performance benchmarks and harvest plans, and its operation during the fishing year will be documented in the form of a case study. For the 2009 EFP, we will document the second year of operation of the community based fishing association, focusing on refinements in governance, harvest planning, and organization that will emerge from this experience.

10.2 How does the economic performance of the fishery change under gear switching and cooperative local management?

Fishing under the 2009 EFP will produce more economic information and will be able to provide additional information on the contributions of the community based fishing association to the well-being of the community and the viability of the enterprise. A second year of information is critical to understanding whether we are able to meet our community goals as we will have worked through many of the inevitable challenges associated with starting an enterprise like this, as artifacts introduced by start-up challenges will be less of a confounding variable in the interpretation of performance data.

A specific focus of the 2008 project is to study the socioeconomic consequences of gear switching and of a cooperative community based fishing association using shared hard caps. This evaluation will use data collected from members (costs, revenues, effort, behavior, beliefs, etc.) as well information on non-members (both historical data from fishermen in the area and available contemporary data).

Through this project, we will provide information on changes in fishing behavior, revenue, marketing opportunities, distribution channels, product value, and costs of monitoring. Our baselines will include past fishing activity in MB/PSL as well as data drawn from fishing done concurrently with the EFP in order to control for temporal effects. In addition, we will gather information and report on the socioeconomic consequences at the community level and other relevant information.

11 Description of how vessels will be chosen to participate in the EFP

TNC will be responsible for developing the lease agreements under which the six Limited Entry Trawl "A" Permits that are the subject of this EFP will be fished and will be responsible for enforcing the terms of their use, including, but not limited to, monitoring and observer requirements, data collection and information sharing, participation in the fishing association and compliance with association guidelines regarding implementation of the fishery, distribution of target and bycatch species, and mechanisms to pace the fishery throughout the year. Failure to comply with lease conditions and agreed upon association guidelines will result in revocation of permission to fish under the EFP.

The selection process will be run by the Committee described in section 8.5. Eligible applicants are those that meet the following criteria, developed jointly by the applicants:

- Meets PFMC eligibility requirements for participating in an EFP fishery as described in Council Operating Procedure No. 19.
- Experience using specified gear, with preference given to those with experience fishing in the geographic area of study.
- Willingness and ability to land in Morro Bay or Port San Luis.

- Access to a suitable vessel that meets Coast Guard safety requirements and can carry an observer.

In 2008, interested fishermen in the Central Coast area were given the opportunity to complete an application to aid in determining their eligibility. A final participant selection process to narrow down participants was facilitated by an impartial selection committee convened and overseen by the Committee. Because fishing under the 2008 EFP has not yet commenced it remains to be determined whether continuing with the same group of fishermen is of interest to either the fishermen or the members of this partnership. If not, a new selection process will be run in 2009.

12 For each vessel, the approximate time and places fishing will take place, and the type, size and amount of gear to be used

Under this EFP, no more than six vessels will use longline, trap, pot, and hook-and-line gear and will have the opportunity to fish between the date the 2009 EFP is issued and December 2009. Fishing will be constrained to the area between 36° North latitude (Point Lopez) and 34°27' North latitude (Point Conception) and in waters outside of the seaward boundary of the rockfish conservation area (deeper than 150 fathoms).

All fishing by EFP vessels will be done in compliance with state and federal regulations, with the exception of the exemptions granted by this EFP.

Vessels will be required to land fish in Morro Bay or Port San Luis.

Participants in the fishing association and the Committee will work cooperatively to develop a harvest plan for the fishing association that describes how fishing under the EFP will proceed. This plan will describe the requirements for participation in the EFP and the penalties for failure to comply. In addition to specifically describing the structure of the association, the specific goals and purposes – as described in this EFP, and the group's decision-making process, roles and responsibilities and communication requirements.

13 Signature of applicant (on behalf of all applicants)

Margaret Spring

Margaret Spring, Director
California Coastal and Marine Program
The Nature Conservancy

Agenda Item F.3.a
Attachment 3
June 2008

Subject: RFA/GGFA Exempted Fishery Permit Proposal for 2009
Title: Recreational Rockfish Catch Composition in the Rockfish Conservation Area Using Gear-Based Harvest Controls
Date: May 18th, 2008

Applicants:

Recreational Fishing Alliance
Contact: Jim Martin, West Coast Regional Director
P.O. Box 2420, Fort Bragg, CA 95437
(707) 357-3422

Golden Gate Fishermen's Association
Contact: Roger Thomas, President
P.O. Box 40
Sausalito CA 94966
(415) 760-9362

Justification: Since the implementation of the Rockfish Conservation Area as a bycatch reduction measure to protect overfished species such as canary rockfish, over 90% of the EEZ has been closed to recreational rockfishing. This proposal would exempt a specific number of CPFV vessels in north-central California to fish in and seaward of the RCA for underutilized species such as chilipepper.

Potential impacts: There is some historical data for recreational catches of rockfish on the slope, but no recent data is available. Impacts on canary rockfish and cowcod should be very low.

Purpose and goal of the experiment: To use selective recreational fishing gear, hook and line, to access underutilized species of chilipepper rockfish. While this study will test different hook and line gear to discover ways to avoid overfished species, this experiment is primarily an area-based study. The data provided from this series of trips on CPFV vessels would provide management guidance to open a new market for fishing trips on the charter fleet in northern and central California (from Point Conception to the 40-10 line). Experimenting with different types of terminal tackle results in a more selective fishery. Anglers will retain all legal fish. This EFP would be limited to the CPFV fleet to control effort, and to provide observer coverage, but the data gathered could result in a new fishery for the entire recreational fishing fleet.

Broader Significance: the data collected should prove that a recreational fishery can be conducted for abundant and underutilized species such as chilipepper rockfish without impacts to overfished species. If successful, management can shift some of the recreational effort away from inshore species and areas where interactions with canary rockfish are common.

Duration of the EFP: One year (2009). This is an extension of our previous request for the recreational EFP the Council approved in 2007. As of this date, we have yet to receive permits approved in 2007. In order to gather data for a full calendar year, we are requesting that this EFP be renewed for one more year. We are modifying our EFP proposal with input from Oregon Anglers to test gear targeting mid-water species like chilipepper and yellowtail rockfish inside the RCA.

Number of vessels: Approximately 15 Charter Passenger Fishing Vessels (CPFVs).

Participants in the EFP:

Capt. Ken Stagnaro *Velocity*, Santa Cruz (831) 425-7003
Capt. Tim Gillespie, *Seahawk*, Fort Bragg (707) 964-1881
Capt. Don Akin, *Lady Irma II*, Noyo Harbor, Fort Bragg (707) 964-3000
Capt. Randy Thornton, *Telstar*, Noyo Harbor, Fort Bragg (707) 964-8770
Capt. Bob Ingles, *Queen of Hearts*, Half Moon Bay (650) 728-3377
Capt. Alan Chin, *Tigerfish*, Half Moon Bay (650) 726-7133
Capt. Dennis Baxter, *New Captain Pete*, Half Moon Bay (650) 726-6224
Capt. Steve Moore, Morro Bay

Capt. Tom Mattusch, *Hulicat*, Half Moon Bay (650) 726-2926
Capt. Jay Yokomizo, *Huck Finn*, Emeryville (510) 527-3768
Capt. Craig Shimokusu, *New Salmon Queen*, Emeryville (510) 385-1135
Capt. Robert Gallia, *Eldorado*, Berkeley (415) 298-3948
Capt. Bill Parducci, *Profish'nt*, Bodega Bay (707) 463-3618

Funding: This EFP will be self-funding with individual anglers paying for an offshore rockfish trip. Grant funding is available for data analysis and observer coverage. The RFA's 501c3 account, the Fisheries Conservation Trust, received a grant for $5,000 for the data analysis for this project, and additional funds are available if needed.

Description of Target species: Chilipepper rockfish. This species can be targeted in midwater and is vastly underutilized (1000+ mt under OY).

Harvest Control: Under current regulations, anglers are limited to two hooks per line, with a bag limit of ten rockfish. We are requesting to use up to five hooks. For a load of 15 anglers, a vessel would retain a maximum of 150 fish per trip, with full observer coverage at-sea. CPFV logbooks will record species landed. While recent catch data is unavailable for the recreational fishery in deep water, a review of mortality impacts from the commercial sablefish fishery indicate zero bycatch of cowcod, zero bycatch of widow rockfish, and a total projected bycatch of canary rockfish for 2007 in the combined fixed gear (sablefish and non-sablefish) of 1.1 metric tons. In November 2007, the Pacific Fishery Management Council approved the following bycatch caps for this EFP:

Bocaccio	Canary	Cowcod	Darkblotched	Widow	Yelloweye
2.7 mt	50 lbs	50 lbs	0.1 mt (150 lbs)	0.7 mt	50 lbs

The Council did not take up the issue of Pacific Ocean Perch (POP). While POP are not normally caught in hook-and-line fisheries, we propose a bycatch cap 300 pounds for this overfished species. This would be less than .001 percent of the 2007 OY for POP.

Enforcement: The Council discussed a number of issues related to enforcement of the EFP. Under the full retention provisions of this EFP, questions arose about the disposition of prohibited species and whether they would count against an angler's bag limit. At this depth it makes a live release of rockfish highly unlikely. We discussed this issue with CDFG enforcement staff, and they did not want to be required to pick up fish. We propose to retain all fish as part of each angler's bag limit of ten fish. The EFP's bycatch caps provide harvest controls for the entire EFP. The participants in this EFP would be exempt from sub-bag limits (on bocaccio, for example). They would retain canary and yelloweye under the overall bycatch cap of 50 pounds total. Each angler would be provided a letter reflecting the date of the trip, the vessel participating, and the angler’s name, reflecting their participation under the terms of the EFP. If questioned by a warden in the parking lot the angler can show this document to the warden indicating his or her participation in the EFP. A sample draft letter is attached.

Proposed Data Collection and Analysis Methodology: Data collection will be consistent with the existing CRFS data collection and analysis system. Expansion of the data modeling can provide an estimate of potential catches for both private boaters and the CPFV fleet, should the Council decide at a future time it would consider providing more fishing opportunity to the entire recreational sector. Onboard observers will count and identify the fish, with 100% retention to guarantee accurate identification and age class data. Type of terminal tackle (weights, lures, hook sizes) would be recorded for comparison purposes and bycatch reduction data. Vessels will record other information such as location, depth and water temperatures. By fishing different depth strata throughout an entire year, variations by depth and month can be identified. The goal of the data collection format and data analysis will be to gather enough information to project the outcomes for an expansion of the fishery throughout the recreational sector.

Participation: Commercial Passenger Fishing Vessels with a clean logbook reporting record will be chosen (by lottery amongst interested captains) from various ports such as Monterey, Santa Cruz, Bodega Bay, Half Moon Bay, San Francisco Bay Area and Fort Bragg where the slope is reachable on a day trip.

Time, Place and Amount of Gear Used: This EFP would be conducted during fair weather days during the entire year of 2009, with anglers limited to one rod apiece, two hooks per line, with a 3-10 pound weight limit. All fishing would occur in the non-trawl Rockfish Conservation Area between Pt. Conception and the Oregon border, from depths ranging from 900 to 2000 feet and beyond. To the extent we can keep off the bottom, we expect that we can avoid some of the overfished species. Fishing gear can be modified using a drop leader between the weight and the hooks to keep lures off the bottom. A float on the dropper line can keep the hooks off the bottom.

Science Advisor:
Doyle Hanan, PhD
Hanan & Associates
POB 8914
Rancho Santa Fe CA 92067

Data Collection and Review: Data will be collected by on-board observers hired through the Pacific States Marine Fisheries Commission (PSMFC) and submitted to the data analyst for quality checks following each observed trip. Data quality checks will include checking all forms for completeness, appropriate species composition (observers will be expected to document each new species encountered to confirm species identification; documentation will be consistent with NMFS observer programs' protocols for species identification form submission), proper ordering of observed sets and anglers, proper data coding, and other logical checks that may be made by the analyst. All attempts will be made to overcome shortcomings in data collection through consultation with the observer. Feedback will be given after every submission to ensure complete and accurate data collection on subsequent trips. Catch of any overfished species for which the Council has recommended bycatch caps will initiate immediate notification of NMFS of that event.

Data Entry: Original hardcopies will be retained by the data analyst with copies sent to Connie Ryan of the California Department of Fish & Game for departmental records, and to PSMFC for data entry. PSMFC will conduct subsequent data quality checks required for entry of data and other checks built into their entry system. Their computer will check species ranges, reasonable lengths/weights and various cross checks on the forms for totals, anglers, limits etc. Entry will be complete no later than six business days following receipt of forms by PSMFC. Files will then be sent to the data analyst with each individual caught (including all data elements linked to that individual) as well as separate files of catch data aggregated by set.

Data Analysis and Reporting: On a monthly basis, the data analyst will stratify and report catch for the overall fishery and for each management region included in the EFP (Northern, North Central, Monterey South-Central and Morro Bay South-Central). Monthly reports will be compiled and submitted to NMFS within two weeks following the end of each calendar month and will include catch statistics for the most recent month and year to date totals. Catch will additionally be separated for analysis by disposition (retained vs. individuals that would normally be discarded) with separate CPUE (CPAD and/or CPAH) calculations made for each species of each disposition. Catch will be further stratified by terminal tackle, depth, specific lat/long locations and any other variables determined to provide significant differences through Ward's multivariate cluster analysis of catch rates for individual species. Species encountered will also be plotted against number of trips to produce a simple discovery curve for the EFP.

Expansion estimates will be reported twice for the EFP, once with data collected prior to traditional rockfish season openings and again following conclusion of the EFP period (year end or caps met) in the final report evaluating the EFP. Initial expansion estimates will consider only the effects of opening the fishery during winter months in which anticipated effort will not offset effort from the traditional fishery. Estimates of participation will be calculated using surveys of EFP trip participants and of anglers in the study area intercepted by the samplers. To supplement these tools, upon the openings of rockfish seasons, detailed survey forms will be distributed to recreational anglers found to be targeting rockfish during angler intercept surveys. These surveys will provide detailed information on the current understanding of the fishery (effort and catch statistics, distances traveled, species composition and length frequencies of various species) to give the survey participant an accurate picture of the fishery. Participants will then be asked to estimate the numbers of trips they would expect to make during the season closed for traditional rockfishing (as above) as well as how many nearshore directed trips they would expect to be offset by participation in a deepwater chilipepper fishery. The levels of response will be combined with rockfish catch and effort data from the history of CRFS (since January 2004) to determine expansion factors for collected data.

Final reporting will summarize the catch totals for the duration of the EFP with data stratification as indicated for the monthly reports. Final reporting on this EFP will include the expanded estimates for the complete opening of this fishery to the recreational community as well as alternative expansions such as opening the fishery coincident with the traditional rockfish seasons, expansion only to the CPFV fleet, and any other expansions potentially indicated by the data (specific management/geographic regions, depths, terminal tackle configurations, etc.) to provide the Pacific Fisheries Management Council with a range of options for permitting of the fishery.

Signature of Applicant:

Jim Martin

[original signed]

James Martin, RFA

Roger Thomas

[original signed]

Roger Thomas, GGFA

Oregon Recreational Yellowtail Rockfish EFP

Application

A. Date of application

May 21, 2008

B. Applicants

Southern Oregon Sport Fishermen
Contact: Wayne Butler
P.O. Box 674
Bandon, OR 97411
(541) 347-9126

Recreational Fishing Alliance, Oregon Chapter
Oregon Anglers
Contact:
John Holloway
6823 SW Burlingame Ave.
Portland, OR 97219
(503) 452-7919

C. Statement of purpose and goals

This EFP will test the possibility of conducting a recreational fishery targeting an underutilized species using special gear. This gear will be designed to avoid and/or minimize impacts on species of concern. Full retention of all species will be required. Disposition of targeted species (yellowtail rockfish) will be to experiment participants. Disposition of species of concern will be to sampling staff when biological sampling is needed or to participants when not.

D. Justification for EFP

In the next few years recreational fishing depth and area closures are to become the most constraining in history. This is due primarily to one species, yelloweye rockfish. These closures apply to the entire water column for most groundfish FMP species. Yelloweye reside near the bottom in select habitats. Midwater species exist in relative abundance, yet are inaccessible. It is believed that special gear can be developed which can provide access to midwater species without causing any additional impacts to yelloweye rockfish. Bottom habitat is all that needs protection from hooking impacts. This could provide increased opportunity for recreational fisheries and relieve fishing pressure on nearshore species. Increased opportunity is something that has been lacking for many years of incremental constraints on all fisheries. This EFP will allow legal retention of prohibited species for best utilization of data sources.

E. Broader significance and fleetwide applicability

Recreational midwater specific gear can easily be modified to apply to midwater fixed gear commercial fishing. The same data and concepts could be applied to hook and line as well as midwater longline applications.

F. Duration of EFP

One year with a possible renewal application in June ’09 if necessary.

G. Number of vessels covered under this EFP.

There will be a total of 10 recreational charter vessels covered. They are as follows:

1. Capt. Ken Butler, *Prowler*, Bandon, OR (541) 347-3508
2. Capt. Jon Brown, *Kerri-Lynn*, Garibaldi, OR (503) 355-2439
3. Capt. Darrel Harper, *Umatilla II*, Newport, OR (541) 867-4470
4. Capt. Lars Robison, *Sampson*, Depoe Bay, OR (541) 765-2545
5. Capt. Mick Buell, *Norwester*, Garibaldi, OR (503) 322-0007
6. Capt. Wayne Butler, *Mis-Chief*, Bandon, OR (541) 347-9126
7. Capt. Joe Ockenfels, *Siggi-G*, Garibaldi, OR (503) 322-3285
8. Capt. Mike Sorenson, *Miss Raven*, Newport, OR (541) 867-4470
9. Capt. Bob Bales, *D&D*, Garibaldi, OR (503) 322-0007
10. Capt. Scott Howard, *Strike Zone*, Winchester Bay, OR (541) 271-9706

H. Description of species and amounts.

Target species are yellowtail rockfish. Expected encounters of overfished species include widow, canary, and yelloweye rockfish. A bag limit of 15 yellowtail rockfish will be used and this quantity is the base for impact estimates.
There will be 10 vessels and 12 anglers average per trip. There will be 30 trips. This will result in 360 angler-days.

Total estimated impacts (caps):

Yellowtail = 5.9 mt	(ref.) 5,400 fish x 1.09 kg (ODFW 1993-1999)
Widow = 1.2 mt	1,440 fish x 0.85 kg
Canary = 2.6 mt	1620 fish x 1.58 kg
Yelloweye = 0.2 mt	90 fish x 2.18 kg

The above impacts by weight will be the total caps for this EFP. A reference catch rate by average number of fish per angler per trip will be monitored for the duration of this project.
That catch rate is:

Target species: yellowtail rockfish-Individual bag limit 15
Overfished species: Widow rockfish 4 per angler
Canary rockfish 4.5 per angler
Yelloweye rockfish 0.25 per angler

I. Monitoring

At-sea on board observers will be used on all trips. These observers will be PSFMC certified groundfish observers. They will be provided through ODFW sampling and observer programs.

J. Data collection and analysis methodology

Monitoring and data.

Direction of observer coverage will be under Mr. Don Bodenmiller ODFW Marine Resources Program. ODFW will monitor, through observers, catch rates and progress toward project caps. Data will be recorded at a “drift” level. Drift level recording will make statistical comparison with existing ODFW long leader research easier. All overfished species will be “lengthed and sexed.” Observers will gather species needed for biological analysis. Individual trips will not proceed if observer coverage is unavailable. Observer bookings must be made in advance of anticipated trips. If the bycatch caps are reached the project will be terminated. If the bycatch rate (section H) is being exceeded the project will be suspended until needed changes allowed within this EFP can be determined and implemented. Timely observer communication regarding ongoing catch rates will be a top priority.

Analysis.

Direction of data collection and analysis will be under Mr. Bob Hannah ODFW Marine Resources Program. Bycatch rates resulting from prosecution of this EFP will be compared to similar data from fisheries, fisheries projection models, and ODFW long leader research. This can be done geographically and/or using nonparametric statistical testing. The success criteria would be for the bycatch rates for overfished species to be significantly less than the nearshore fishery.

K. Criteria for vessel selection

They have been chosen based on the individual owner/ captain history of successful participation with prior fishery management monitoring and special projects.

L. Time, place and gear.

Time

The fishing time will take place between late spring and early fall. This is the normal weather friendly window and also in between the possible all depth recreational seasons.

Location

Where possible, trips will be evenly distributed between the ports. Some port bias may be necessary due to availability of participating resources.

Depth

The project will be conducted in any area seaward of normal recreational depth closures (presently 40 fathoms).

Gear.

The gear to be used will be designed to locate hooking gear in a midwater location to avoid bottom dwelling species. The proposed gear for this fishery would employ the use of a long leader between sinker and hooks. The purpose would be to elevate the hooking gear above the bottom a sufficient distance to avoid and or minimize contact with species of concern. Leader lengths of 30, 40 and 60 feet may be tested. A starting point will be a leader of 40 feet. A change of length will only be made if incidental impacts are high or access to target species is low without high incidental impacts. A float will be affixed to the upper end of the leader. The purpose of this float is to prevent hooking gear from descending below the upper level of the leader. The float must have sufficient buoyancy to support all hooking gear and line above equivalent to leader length. Current tests show that a buoyancy of 2.25 ounces would be sufficient. Floats must be constructed of solid material. They can be either wood or closed cell high density foam. No hollow floats allowed. Maximum number of hooks is to conform to current regulation (3). Small plastic worms and flies will be used. Weighted hooks, bait and large lures will be prohibited.
(note): The leader length is for reference purposes only. The determinant shall be the distance between the sinker and the lowest hook. It is this dimension that will be the rule.

M. Signatures

Wayne Butler

John Holloway

9 May 2008

RECEIVED
MAY 14 2008
PFMC

To: Pacific Fishery Management Council
Atten: John DeVore
7700 NE Ambassador Place Suite 101
Portland, Or. 97220-1384

EFP Applicant:
Gerald Mikell
95658 House Rock Rd
Brookings, Or. 97415
(541) 469-1215
(541) 661-1242 (cell)
gmikell@nwtec.com

Enclosed is my application for a Yellowtail Rock Fish Experimental Fisheries Permit (EFP) . If further information is needed please advise.

Respectfully

Gerald Mikell

Request for Experimental Fisheries Permit (EFP) for Yellowtail Rock Fish.

Social and Economic Comments:

Fisheries off the shores of the Northwest United States have played a major role in the development of regional commerce, trade, and society in communities bordering the Pacific Ocean. In the current attempt to protect over fished species the city of Brookings, like most other coastal fishing towns, has experienced substantially reduced landing allowances for both commercial and sport fisheries. Many, who have for decades relied on the once rich fisheries for their livelihood, are now faced with a diminishing quality of coastal living. In this application for an Experimental Fisheries Permit (EFP) the small boat ground fishery and the expansion of the live fish market is of particular interest. The near shore fishery under present circumstance lacks a quota necessary to sustain a livelihood. Larger boats are surviving reduced quotas only by working several fisheries, e.g. salmon, crab, blackcod, and near shore fish. When the salmon or crab season is poor larger boats move to near shore ground fishing normally fished by smaller vessels. The near shore industry is thus impacted by more boats fishing for a fixed quota. Size and restricted gear capability precludes most small near shore boats from participating in other fisheries. Couple this with abnormal poor year harvests like we see in 2008, it is apparent that the small boat industry is financially challenged. Any effort to expand small boat access to fish outside the near shore arena, as proposed herein, could provide an avenue of financial relief to the near shore fishery and towards meeting PFMC/GMT goals.

ECONOMICS and EFFICIENCY:

With greater pressure mounting on the Nearshore fishery, coupled with problems of bycatch of over fished species, it is imperative that new concepts and fishing techniques be developed for species like Yellowtail. Currently, federal regulations allow only 200 pounds of Yellowtail per month. However, for the near shore fishery, Yellowtail can not be caught because it is normally found mostly within the Rockfish Conservation Area (RCA).

The Yellowtail rock fish is considered a prime target for expanding the live fish market. Please note that this fish has a very high survival rate owing to its' natural ability to release large quantities of swim bladder gas when ascending through the water column. In short they are an ideal fish for the live fishery.

Adding Yellowtail to the live market will improve the economics and efficiency as fresh fish typically bring about $.80/lb to $1.00/lb but Yellowtial sold to the live fish market will bring $2.00/lb, thus doubling revenue/lb. Developing a Yellowtail live market will reduce pressure on other near shore species by expanding the overall fishing arena. Thereby meeting the PFMCs' goal to explore ways to reduce efforts on depressed stocks. Employing clean fishing techniques, as stated in attachment (1) , will also meet PFMC goals to reduce bycatch levels of over fished species.

PROPOSAL:

It is requested that the originator of this proposal be issued a EFP and permitted to gain access to the RCA for the purpose of harvesting Yellowtail (*Sebastes flavidus*) at specific measured depths and determined locations. General information regarding gear, tackle, and technique is provided in attachment (1). The trip limit can be held to 500 lbs per trip with a 10,000 pound annual quota. When available NOAA observers will ride the permitted vessel and document catch information. Otherwise, a logbook will be maintained to record all aspects of each trip, e.g., species caught - weight total, depth fished - water temp, bottom depth and gear type. All bycatch will be relinquished to Oregon ODFW or released for survival. It is anticipated that initial trips could have low levels of Canary bycatch, that is until such time as depth, lure selection, technique strategy, and electronic school identification processes are developed. Initial fishing sets will be conducted with a minimum number of hooks, i.e., 1 to 5 ganged hooks (two poles), to reduce initial bycatch impact. Calibrated Digital Electric Reels (CDER's) will be used to measure depths being fished and to provide accurate measurement for logbook data. A high end plot-charter and fish-finder will be utilized to help identify species school characteristics and mark exact location of schools to be fished.

The bycatch of canary should be minimal or near zero. Fish targeted at upper levels will eliminate bycatch of bottom and deeper mid-water dwellers (Yelloweye and Canary). The bycatch of Yelloweye rock fish within the Yellowtail EFP fishery, should be ZERO even during in the initial stages.

ATTACHMENT (1)

Strategy: Locate Yellowtail in upper columns of water, i.e., surface to 15 fathoms. Long range goal will be to locate Yellowtail in water columns 8 fathoms or less.

Technique: Troll minimum number of lures or flies with electric reels until Yellowtail school is located, verified, and exact position marked -- then deploy larger number of hooks/per/line up to 25 (basically Vietnamese gear). Yellowtail breezing on surface may be fished with single lead lures similar to that used on black rock fish.

Boat: 26 ft with custom live well (500# capacity)

GEAR: (1) Electric Digital Reels
(2) Light weight rod/reel
(3) Vietnamese line (25 hooks)
(4) Assorted lures -- shrimpfly and lead jigs

Target Area: Reef located 3.1 nautical miles north of Pt St. George provides ideal structure for this fishery. It is close to mainland harbor, it provides safe condition for small boat operations, and is close to wholesale buyer. This reef also has history of Yellowtail which dwell in upper water columns.

Agenda Item F.3.a
Attachment 6
June 2008

Subject: RFA/GGFA Exempted Fishery Permit Proposal for 2009
Title: Recreational Flatfish Catch Composition in the Area Around and Seaward of the Rockfish Conservation Area
Date: May 21, 2008

Applicants:

Recreational Fishing Alliance
Contact: Jim Martin, West Coast Regional Director
P.O. Box 2420, Fort Bragg, CA 95437
(707) 357-3422
(707) 964-8326

Golden Gate Fishermen's Association
Contact: Tom Mattusch
P.O. Box 957
El Granada, CA 94018
(650) 726-2926

Justification: Since the implementation of the Rockfish Conservation Area as a bycatch reduction measure to protect overfished species such as canary rockfish, over 90% of the EEZ has been closed to recreational rockfishing. This proposal would exempt a specific number of CPFV vessels in north-central California to fish around and seaward of the RCA for underutilized species of Flatfish such as Dover sole, Petrale sole, Butter Sole, Arrowtooth Flounder, Curlfin Sole, and English Sole with minimal bycatch of overfished species. By targeting rockfish 'coldspots', areas where no reports of rockfish interaction exist, data may be developed contributing to finer resolution spatial management.

Potential impacts: There is some historical data for recreational catches of rockfish on the slope, but no recent data is available. Impacts on overfished species, particularly canary rockfish and cowcod, should be very low. Recreational impacts on slope fishing for various sole is virtually non-existent.

Purpose and goal of the experiment: To use selective recreational fishing gear, hook and line, to access underutilized species of Dover sole & Petrale sole and other Flatfish while keeping bycatch of overfished species low. While this study will test different gear types to discover ways to avoid overfished species, this experiment is primarily an area-based study. Its' purpose is also to take pressure off the nearshore. (Note: vessels conducting trips under this EFP will not be allowed to fish inside the state's depth restrictions for groundfish on the same trip.) The data provided from this series of trips on CPFV vessels would provide management guidance to open a new market for fishing trips on the charter fleet in northern and central California. This EFP will require the CPFV fleet to control effort, and to provide observer coverage, but the data gathered could result in a new fishery for the entire recreational fishing fleet. It will also serve as a step towards finer resolution spatial management.

Broader Significance: The data (catch composition, depth strata, interaction with overfished species, etc) collected should prove that a recreational fishery can be conducted for abundant and underutilized species such as Dover sole, Petrale sole and other Flatfish without impacts to overfished species. If we are successful, and demonstrate that we can avoid bycatch around and seaward of the 150 fathom line, management can shift some of the recreational effort away from inshore species and areas where interaction with canary rockfish is commonplace. An important measure of success will be determining the economic viability of this type of trip, adding a much-needed alternative fishery for the recreational sector.

Duration of the EFP: Year to year beginning in 2009. The Groundfish Management Team recommended collecting data from each month of the year to find out whether there are seasonal variations in the catch data. Given the timeframe we are working under, we request the EFP be conducted over a calendar year from the time we are issued the permits.

Number of vessels: Approximately 15 California Passenger Fishing Vessels (CPFVs).

Funding: This EFP will be self-funding with individual anglers paying for an offshore rockfish trip. Grant funding is available for data analysis and observer coverage. [We have been awarded a Mendocino County Fish & Game Commission grant for $5,000 and have an additional $2,000 pledged for the cost of the data analysis.]

Description of Target species: Species of Flatfish such as Dover sole, Petrale sole, Butter Sole, Arrowtooth Flounder, Curlfin Sole, English Sole, Flathead Sole, Pacific Sanddab, Rex sole, Rock Sole, Sand sole and Starry flounder. California and/or Pacific Halibut could be retained if encountered. These species can be targeted in midwater and bottom and is vastly underutilized (1000+ mt under OY).

Harvest Control: Anglers will be limited to up to five hooks per line, with a personal bag limit of ten fish. For a load of 15 anglers, a vessel would catch approximately 150 rockfish per trip, with full observer coverage at-sea. The program will utilize trained CRFS samplers, coordinated through PSFMC who have agreed to enter the data. The applicants (and RFA's Fisheries Conservation Trust) will contract with Pacific States and schedule on-board observers approximately two weeks in advance of any trip. RFA will pay for the observer costs through its Fisheries Conservation Trust account, passing the costs onto the charter captains. RFA's Jim Martin will function as "Chartermaster" for all trips, and no trips will be scheduled without approval from the Chartermaster, to allow for advance scheduling of observers with Pacific States to ensure full coverage of all trips and to ensure that no trips occur after bycatch caps have been reached.

To address concerns about a "gold rush" with fifteen charter vessels up and down the coast, each charter captain will need to sign a contract with the applicants. This contract will outline the responsibilities of the applicants and the charter captains. The applicants are committed to maintaining their good reputations within the industry and will not tolerate "bad actors" or lawbreakers. Revocation of the EFP for individual vessels by NMFS could be time consuming. A contract with the captains will stipulate that the permit holders will surrender the permit to the Chartermaster upon demand, without "due process." We understand that NMFS will issue permits to individual vessels. We request that all the permits issued be sent to the Chartermaster to ensure each captain has a contract with the applicants before receiving the individual vessel permits and understand the terms and conditions of the contract and the EFP.

During the initial phase of this experiment, we intend to go slowly and have a limited number of trips, no more than one trip per day, to ensure that our bycatch caps are not exceeded. Any catch of yelloweye or canary – even one per vessel – will cause us to rethink our strategy. As we gain confidence and experience with the logistics of the project, we can gradually expand the number of trips, and have multiple trips per day as long as we can prosecute the fishery cleanly.

Our Science Advisor will monitor the running total against our bycatch caps. After any trip that lands canary, yelloweye or cowcod, the captain will call the science advisor after returning to port. The science advisor will notify NMFS on the next business day of these landings of these species. Each trip will be limited to no more than half the remaining allotment under the bycatch caps. Catch of other overfished species for which the Council has recommended bycatch caps will be included in the biweekly reports by the science advisor to NMFS.

While recent catch data is unavailable for the recreational fishery in deep water, a review of mortality impacts from the commercial sablefish fishery indicate zero bycatch of cowcod and zero bycatch of widow rockfish. According to the most recent PFMC scorecard, a total projected bycatch of canary rockfish for 2007 in the combined fixed gear (sablefish and non-sablefish) of

1.1 metric tons. In November, the Pacific Fishery Management Council approved the following bycatch caps for this EFP:

Bocaccio	Canary	Cowcod	Darkblotched	Widow	Yelloweye
2.7 mt	50 lbs	50 lbs	0.1 mt (150 lbs)	0.7 mt	50 lbs

The Council did not take up the issue of Pacific Ocean Perch (POP). While POP are not normally caught in hook-and-line fisheries, we propose a bycatch cap 300 pounds for this overfished species. This would be less than .001 percent of the 2007 OY for POP.

Regulatory Exemptions: We are requesting to be exempted from state and federal seasonal closures on groundfish and certain gear and depth restrictions on recreational groundfish. Current regulations provide for seasonal closures that vary according to the management region. We request a full calendar year to conduct the EFP. Current regulations prohibit retention of canary and yelloweye rockfish, and provide sub-bag limits for species such as bocaccio. We request to be exempt from these provisions, replacing them with the bycatch caps. We further request to be exempted from the 2-hook restriction and ask to test up to five hooks per line. Based on discussions with charter captains with historical participation in the Flatfish, Dover sole & Petrale sole fishery, five hooks are more likely to be stopped by a school of mid-water fish than two hooks. Vessels will not participate in the nearshore groundfish fishery out of season, nor during the regular season on days when they conduct EFP trips. Vessels on EFP trips may also participate in non-groundfish fisheries (crab, salmon, albacore and Humboldt squid, for example) on the same day, should the Flatfish, Dover sole & Petrale sole fishing turn out to be slow.

Enforcement: We propose to retain all fish as part of each angler's bag limit of ten fish. This EFP will require an exemption from sub-bag limits (on bocaccio, for example) and size limits. The EFP's bycatch caps provide total catch limits for the entire EFP. Anglers will retain canary and yelloweye within their ten fish bag limit and under the overall EFP bycatch cap of 50 pounds total. Each angler would be provided a letter reflecting the date of the trip, the vessel participating, and the angler's name, reflecting their participation under the terms of the EFP. If questioned by a warden, the angler can show this document to the warden to indicate his or her participation in the EFP. A sample draft letter:

This letter certifies that on _______________ (today's date), ____________________________ (name of angler), under CDFG recreational fishing license # ________________________ participated in a Federal Exempted Fishing Permit ________________________ (vessels EFP ID number) titled "Recreational Flatfish Catch Composition in the Area Around and Seaward of Rockfish Conservation Area."

This EFP is limited by cumulative bycatch caps and exempts the angler from sub-bag limits on bocaccio and other species, and is exempt under federal rules from seasonal closures on groundfish, certain terminal gear restrictions and prohibitions on retention of overfished species.

This letter is to inform state and federal enforcement personnel that the EFP has been approved by the Pacific Fisheries Management Council and the National Marine Fisheries Service.

Enforcement personnel can verify the angler's participation in the EFP by contacting the CPFV Captain:
(name of vessel)
(Contact info)

For questions regarding the EFP, contact NMFS Northwest Region at (206) 526-6140.

Proposed Data Collection and Analysis Methodology: Data collection will be consistent with the existing CRFS data collection and data entry will be provided by PSFMC. Expansion of the data can provide an estimate of potential catches for both private boaters and the CPFV fleet, should the Council decide at a future time it would consider providing more fishing opportunity to the entire recreational sector. Onboard observers will count and identify the fish, with 100% retention to guarantee accurate identification and age class data. Type of terminal tackle (weights, lures, hook sizes) would be recorded for comparison purposes and bycatch reduction data. Vessels will record other information such as location, depth and water temperatures. By fishing different depth strata throughout an entire year, variations by depth and month can be identified. The goal of the data collection format and data analysis will be to gather enough information to project the outcomes for an expansion of the fishery throughout the recreational sector.

Participation: Commercial Passenger Fishing Vessel Captains who have complied with all past logbook reporting requirements will be eligible for conducting trips under this EFP. Only Captains approved by NOAA enforcement personnel, based on a background checks on prior violations, will be considered for these trips. The Chartermaster will demand the surrender of permits from EFP participants at his discretion.

Time, Place and Amount of Gear Used: This EFP would be conducted during fair weather days during the entire year of 2009, with anglers limited to one rod apiece, two to five hooks per line, with a 1.5-10 pound weight limit. All fishing would occur around and seaward of the Rockfish Conservation Area between Pt. Conception and the Oregon-California border, from depths ranging from 800 to 2000 feet and beyond. Rockfish coldspots will be the areas targeted. Various terminal tackle will be tested for optimizing the avoidance of overfished species. Each vessel will display a banner with the logos of the RFA, GGFA and NOAA indicating the vessel's participation in a research experiment, so that nearby recreational vessels will not assume that the fishery is open to anyone and start fishing next to the permit holder. It may be repeated in 2010 if there are not enough trips for a meaningful analysis of finer resolution spatial management to yield regulatory information basis.

Data Submission, Analysis And Reporting:
Science Advisor: (resume attached)
Doyle Hanan
P O Box 8914, Rancho Santa Fe, CA 92067

(858) 832 1159 drhanan@cox.net

Data Collection and Review: Data will be collected by on-board observers hired through the Pacific States Marine Fisheries Commission (PSMFC) and submitted to the data analyst for quality checks following each observed trip. Data quality checks will include checking all forms for completeness, appropriate species composition (observers will be expected to document each new species encountered to confirm species identification; documentation will be consistent with NMFS observer programs' protocols for species identification form submission), proper ordering of observed sets and anglers, proper data coding, and other logical checks that may be made by the analyst. All attempts will be made to overcome shortcomings in data collection through consultation with the observer. Feedback will be given after every submission to ensure complete and accurate data collection on subsequent trips.

Data Entry: Original hardcopies of the log sheets ("Angler Form" and "On Board CPFV Observer" forms) will be retained by the science advisor, and sent to PSMFC for data entry. PSMFC will conduct subsequent data quality checks required for entry of data and other checks built into their entry system. Their computer will check species ranges, reasonable lengths/weights and various cross checks on the forms for totals, anglers, limits etc. Entry will be complete no later than six business days following receipt of forms by PSMFC, who agreed to compile the data. Files will then be sent to the science advisor after each trip (including all data elements from each angler) as well as separate files of catch data aggregated by set.

Data Analysis and Reporting: On a weekly basis, the science advisor will stratify and report catch for the overall fishery and for each management region included in the EFP (Northern, North Central, Monterey South-Central and Morro Bay South-Central). Monthly reports will be compiled and submitted to NMFS within two weeks following the end of each calendar month and will include catch statistics for the most recent month and year to date totals. Catch will additionally be separated for analysis by disposition (retained vs. individuals that would normally be discarded) with separate CPUE (CPAD and/or CPAH) calculations made for each species of each disposition. Catch will be further stratified by terminal tackle, depth, specific lat/long locations and any other variables determined to provide significant differences through Ward's multivariate cluster analysis of catch rates for individual species. Species encountered will also be plotted against number of trips to produce a simple discovery curve for the EFP.

Expansion estimates will be reported twice for the EFP, once with data collected prior to traditional rockfish season openings and again following conclusion of the EFP period (year end or caps met) in the final report evaluating the EFP. Estimates of future angler participation will be calculated using surveys of EFP trip participants and of anglers in the study area intercepted by the samplers.

Final reporting will summarize the catch totals for the duration of the EFP with data stratification as indicated for the monthly reports. Final reporting on this EFP will include the expanded estimates for the complete opening of this fishery to the recreational community as well as alternative expansions such as opening the fishery coincident with the traditional groundfish seasons, expansion only to the CPFV fleet, and any other expansions potentially indicated by the data (specific management/geographic regions, depths, terminal tackle configurations, etc.) to provide the Pacific Fisheries Management Council with a range of options for permitting of the fishery.

Signature of Applicant:

[original signed]

James Martin, RFA

[original signed]

Tom Mattusch, GGFA
M/V Huli Cat

Bycatch Amounts proposed by the Experimental Fishing Permit (EFP) proposals

EFP	**Canary**	**Yelloweye**	**Widow**	**Darkblotched**	**POP**	**Cowcod**	**Bocaccio**
Fosmark	20 fish	At least 3 fish	0.7 mt	0.4 mt	-----	At least 3 fish	3.3 mt
TNC (based on 2008 values)	50 lbs	150 lbs	2 mt	1000 lbs	300 lbs	300 lbs	5 mt
CA RFA/GGFA (chilipepper) (based on 2008 values, except POP)	50 lbs	50 lbs	0.7 mt	150 lbs	300 lbs	50 lbs	2.7 mt
OR RFA (yellowtail)	2.6 mt	0.2 mt	1.2 mt	-----	-----	-----	-----
Mikell (yellowtail)	Minimal, near zero	Expected to be zero	-----	-----	-----	-----	-----
CA RFA (flatfish) (based on 2008 values, except POP)	50 lbs	50 lbs	0.7 mt	150 lbs	300 lbs	50 lbs	2.7 mt
TOTAL VALUES	**2.7 mt + 20 fish**	**0.366 mt + 3 fish**	**5.3 mt**	**1.266 mt**	**900 lbs (0.6 mt)**	**400 lbs (0.266 mt)+ 3 fish**	**13.7 mt**

ENFORCEMENT CONSULTANTS REPORT ON PRELIMINARY REVIEW OF EXEMPTED FISHING PERMITS (EFP'S) FOR 2009

The Enforcement Consultants (EC) have reviewed the proposed EFP's for 2009 and have some concerns over the criteria used to establish a list of EFP participants. The EC would recommend the criteria that establishes who will participate in the EFP's. The EC would offer criteria language similar to what has been established for the Whiting EFP at a later time for Council consideration.

Regarding the Oregon Recreational Yellowtail Rockfish EFP, the EC recommends that the minimum distance between the weight and the first hook be clearly defined so that it is clear it is a minimum distance and not just a leader length.

The EC also has some concern over the use of "cold spots" in the recreational flat fish EFP. Enforcers could be challenged with regard to closed area enforcement. The questions that arise are (1) how will cold spots be defined (2) how does enforcement verify vessel position (Vessel Monitoring Systems?).Without some electronic surveillance, closed area enforcement will be challenging, particularly where large expanses of closed waters are involved.

PFMC
06/09/08

GROUNDFISH ADVISORY SUBPANEL REPORT ON PRELIMINARY REVIEW OF EXEMPTED FISHING PERMITS (EFPS) FOR 2009

The Groundfish Advisory Subpanel(GAP) reviewed the six EFP applications under consideration and is recommending that five of the six applications continue through the EFP process. Although the GAP is forwarding these EFPs through the process the GAP is not necessarily recommending final approval of any of the EFPs.

The GAP has the following comments for the specific EFPs:

EFP #1 Fosmark
The GAP supports moving this EFP forward with an amendment that requires human observers, not cameras.

EFP #2 The Nature Conservancy
The GAP supports moving this EFP forward in the process but has serious concerns about the potential for the EFP to affect existing sablefish fishermen in the area. The GAP notes that under this weeks inseason agenda item action will likely be taken to reduce the open access sablefish fishery trip limits in order to accommodate this EFP in 2008. The GAP recommends reporting to the National Marine Fisheries Service on a weekly basis versus every two weeks. GAP members also expressed concern about the potential for a “derby fishery mentality” if EFP participants felt they were competing with traditional participants in a race for the available sablefish in the area. A race for the fish could result in a variety of negative unintended consequences. Lastly the GAP would like to receive and review a report on the activities from the 2008 EFP prior to making a final decision on the 2009 EFP moving forward.

EFP #3 CA Regulatory Flexibility Act (RFA) (chilipepper)
The GAP supports moving this EFP forward however has concerns about fishing taking place within the RCA and no depth restriction requirements. The GAP would also like to see a more thorough description of the gear to be utilized.

EFP #4 OR RFA (yellowtail)
The GAP supports moving this EFP forward however has concerns about fishing taking place within the RCA and a more clear description of the depth restrictions.

EFP #5 Mikell (yellowtail)
The GAP does not support this EFP moving forward because the information provided in the application does not meet the requirements of a proper EFP. The GAP believes that EFPs for yellowtail do have merit and the GAP would encourage the applicant to review the COPs for EFPs and consider resubmitting an amended application next year.

EFP #6 CA RFA (flatfish)
The GAP supports this EFP moving forward but has some concerns about the methodology for choosing areas to fish where rockfish bycatch will not be an issue.

In general the GAP reminds the Council that for the last few years we have ultimately recommended that no EFPs be given final approval due to the potential impacts on species of concern. The GAP continues to recognize that overfished species impacts from the EFPs could impact current fisheries and believes that appropriate caps on all overfished species should be required for any EFPs that move forward.

PFMC
06/08/08

GROUNDFISH MANAGEMENT TEAM REPORT ON PRELIMINARY REVIEW OF EXEMPTED FISHING PERMITS (EFPs) FOR 2009

The Groundfish Management Team (GMT) reviewed the technical merit of the six exempted fishing permit (EFP) applications relative to evaluation criteria in the Council Operating Procedure (COP) on EFPs. EFPs are commonly used to explore ways to reduce effort on depressed stocks, encourage innovation and efficiency in the fisheries, provide access to underutilized target stocks while directly measuring the bycatch associated with those fishing strategies, and to evaluate current and proposed management measures. A primary requirement of EFPs is the evaluation of fishing gear or management measures that can be transferred into regulation and applied fleetwide. EFPs that rely upon fisher experience, skill or ability that cannot be harnessed through a regulation fail to meet this requirement.

The GMT only reviewed the technical merits of the EFPs and notes that the Council will likely need to make their final decision partially based on the availability of overfished species relative to the 2009 harvest specifications (considered at this meeting under Agenda Item F.4). Therefore no species specific discussion on EFP bycatch limits is included under this agenda item.

Three of the proposed EFP applications (Agenda Item F.3.a, Attachments 1-3) are to renew EFPs that were approved in November 2007. These three applications are, for the most part, fundamentally unchanged from what was adopted in November 2007, and for the reasons outlined in previous GMT statements (June 2007, Agenda Item E.5.c, Supplemental GMT Report; November 2007 Agenda Item D.2.c, Supplemental GMT Report). **The GMT finds technical merit in applications 1 and 2 and recommends that the Council forward them for public comment.** The 2009 version of the Recreational Fishing Alliance EFP (Attachment 3) adds a provision for targeting yellowtail rockfish within the non-trawl Rockfish Conservation Area (RCA). This is a substantial change in the fundamental design of this EFP. There was not adequate information supplied in the application to inform the GMT of the technical merits of this substantive change, therefore **the GMT recommends that the Regulatory Fishing Alliance (RFA) chilipepper EFP application be forwarded for public comment without the addition of targeting yellowtail within the non-trawl RCA.**

The three new EFP applications for 2009 (Agenda Item F.3.a, Attachments 4-6) are intended to increase access to underutilized species in either the commercial nearshore fishery or the recreational fishery. Technical merits for each application are discussed in more detail below.

Oregon Recreational Yellowtail Rockfish EFP, Wayne Butler and John Holloway (Agenda Item F.3.a, Attachment 4)

This application proposes to target yellowtail rockfish in the recreational fishery using long-leader hook and line gears within the recreational RCA off Oregon. The application clearly describes the data collection and analysis, the method for and funding of 100 percent observer coverage and estimates of overfished species impacts. This proposal out and met most of the criteria outlined in the COPs but should provide additional information on who will prepare the draft and final report and when that would be provided to the Council. **The GMT finds technical merit in this application and recommends that the Council forward it for public comment.**

Oregon Commercial Yellowtail Rockfish EFP, Gerald Mikell (Agenda Item F.3.a, Attachment 5)
This application proposes to target yellowtail rockfish in the commercial nearshore fishery using troll gear within the non-trawl RCA off Oregon. The EFP proposes to explore whether incidental catch of yelloweye and canary rockfish can be virtually eliminated in a yellowtail target fishery by using a low hook count test reel to identify yellowtail, then deploying larger troll gear in shallow water 8-15 fathoms.

The GMT is concerned with the ability of the proposal to be transferred into regulation or applied on a fleetwide basis, as it relies on skipper expertise rather than outlining how a specific fishing technique or methodology will be tested. The proposal states that there should be minimal impacts to overfished species, however, there is little information presented to support this claim in the description of the fishing strategy and technique. Current trip limits for yellowtail rockfish in the limited entry (LE) fixed gear and open access commercial fishery North of 40 10' N. lat. is 200 lb/month. The catch limit requested for yellowtail is 500 lb per trip with a 10,000 lb total catch limit, no other catch limits are requested. No justification or information is given to support the request for this catch amount, nor is a description of how canary will be avoided or minimized addressed in this application. All applications need to propose bycatch caps for overfished species, including canary and yelloweye rockfish.

The GMT suggests that the applicant refine the EFP to include a very detailed description of the fishing technique or new gear type (e.g., how fishing location is determined, how gear is deployed) that, if successful, could be and transferred into regulation and applied fleetwide. The GMT also suggests adding an explanation for the yellowtail catch limit that is proposed, and adding bycatch limit species caps to allow for the incidental take of those species to prevent the EFP from prematurely being shut down if any of these species are encountered. The GMT also notes that with all EFPs, 100 percent at-sea observer coverage is necessary and currently the application only specifies that National Oceanic and Atmospheric Administration (NOAA) observers would be utilized when available otherwise logbooks would be used to document catch information.

The GMT does not support the proposal as written due to the concerns above. Although the GMT would support a revision to include a more detailed gear description and fishing technique, we feel that for the application to be adequate for the public to comment, it would need to be largely rewritten. The GMT does encourage the participant to work with their state fishery management agency and National Marine Fisheries Service (NMFS) to re-write the application, following the Council COPs, detailing a fishing technique or gear type that, if successful, could be replicated fleetwide and transferred into regulation.

California Flatfish Recreational EFP, Recreational Fishing Association and Golden Gate Fishermen's Association (Agenda Item F.3.a, Attachment 6)
This EFP proposes to investigate recreational hook and line fishing of flatfish off California in "rockfish cold spots" inside the recreational and non-trawl RCA. The goal of this EFP is to investigate whether a recreational fishery can occur for flatfish species with minimal impacts to overfished species. If successful, this could provide information to develop finer scale spatial management to allow increased opportunity for some underutilized flatfish species.

This proposal, as written, does not directly incorporate a new innovative gear, but does have area based management potential that could be applied fleetwide. However, the GMT notes that there are considerable enforcement concerns with small open areas, or "rockfish cold spots," and this could limit the ability to implement to implement such measures on a fleetwide basis. **The GMT finds technical merit in this application and recommends that the Council forward it for public comment**, however the GMT recommends that the applicant further work with the California Department of Fish and Game, including enforcement staff, to further refine the sample design.

GMT Recommendations:

1. The Mikell proposal be redesigned and resubmitted in June 2009 based on the reasons stated above.
2. The yellowtail portion of the RFA chilipepper EFP should be developed as a separate EFP proposal and resubmitted in June 2009 based on the reasons stated above.
3. The GMT acknowledges the technical merit of the remaining EFPs and recommends adopting them for review with the revisions addressed above.

Finally, the GMT notes that, when widow rockfish become rebuilt, opportunities will open for prosecuting a yellowtail and widow fishery. The re-development of a yellowtail and widow fishery could off-set the restrictions likely to come about as a result of the yelloweye ramp-down strategy. However, at this time there is limited information available to inform the bycatch of other overfished species that would occur in a widow and/or yellowtail fishery. The GMT believes that the EFP process is one avenue for re-developing a fishery on widow and yellowtail rockfish and looks forward to considering future EFP applications that explore ways to access these species.

PFMC
6/9/08

Submitted by: Michael Bell

Agenda Item F.3.d
Exempted Fishing Permit
June 2008

Conserving a Working Seascape in California's Central Coast
Statement of Intent for Disposition of Federal Trawl Permits
Owned by The Nature Conservancy

DRAFT – 6/2/08

Introduction

In 2005, The Nature Conservancy (TNC) partnered with regulatory agencies and trawl fishermen in Central Coast communities to develop a collaborative proposal that would implement recommendations of the National Academy of Sciences[i] aimed at reducing the impact of bottom trawling. Jointly, we identified and successfully petitioned the Pacific Fishery Management Council for 3.8 million acres of important marine habitats that would be off limits to bottom trawl gear. Simultaneously, to reduce bottom trawl fishing effort and to mitigate the economic impact of bottom trawl closures, TNC purchased federal permits and vessels from local fishermen interested in leaving the trawl groundfish industry.

Building on the Conservancy's purchase of federal groundfish trawl permits, the organization leased one of its seven permits to a Morro Bay fisherman in 2007. The lease is a voluntary, private agreement designed to test methods for making fishing more sustainable and economically viable, focusing on techniques to reduce bycatch and conserve habitat. In addition to this effort, the Conservancy is evaluating the benefit of using more selective gear (hook & line and traps) with its remaining permits.

A New Fishing Entity for the Central Coast of California

TNC, along with our partners, believes that a more sustainable groundfish fishery could thrive in the Central Coast, and we are using our permit assets in cooperative fishing experiments to test approaches that could help achieve that vision. The knowledge and the research generated from this effort could help inform management decisions and be used in other West Coast fisheries and the groundfish industry as a whole.

As a next step, TNC intends to work with its fishing and community partners and experts in the region to design and establish a new Central Coast *fishing entity* that can hold and manage fishery assets (permits or quota) and incorporate the following goals into its business decision making:

- **Fishing Industry Goal** – Provide the local fishing industry access to the groundfish resource and the ability to benefit from conservation and improved productivity.
- **Conservation Goal** – Promote groundfish harvesting means and methods that are sustainable, protect the health of the Central Coast marine ecosystem, and reduce bycatch and waste.
- **Community Goal** – Preserve the local fishing heritage, sustain the contributions of the fishing industry to the local communities, and promote fishermen and community stewardship of marine resources.

TNC believes this will provide positive social and environmental outcomes, including preserving California's unique fishing heritage and ensuring that people can buy and eat locally caught and sustainably harvested seafood. TNC is now working with experts to explore how to best design a fishing entity that would meet these goals. This fishing entity is intended to become the entity that ultimately holds and manages fishing privileges purchased by TNC.

We will strive to work with communities on the central coast to ensure that fishermen and communities are vested in the fishing entity and that the entity provides tangible benefits and enhances the future of the groundfish fishery. TNC has no intention or desire that its fishing privileges be "retired" or used to constrain the west coast groundfish fishery.

There are number of principles that will guide development of this new fishing entity:

- Fishing privileges should be dedicated to the Central Coast region to preserve historical and traditional access to groundfish resource.

- The new fishing entity should have the incentive and means to enhance the value of its fishing privileges by improving Central Coast groundfish stocks and pursuing emerging seafood markets.

- The fishing entity will have access to or develop its own research capacity to better understand the health of local groundfish stocks and ecosystems.

- The fishing entity should be financially self sufficient – providing profitable fishing opportunities to participants, supporting its operations, and have the ability to raise capital to support its initiatives.

TNC would like to thank the many fishery and fishing community stakeholders that have worked with us to develop this goal of a sustainable groundfish fishery for the communities of the Central Coast. We hope that this statement of intent might help clarify our long term plans and foster a productive dialogue regarding these efforts.

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[i] NRC. 2002 *Effects of Trawling and Dredging on Seafloor Habitat.* National Academy Press, Washington, DC.

Agenda Item F.4
Situation Summary
June 2008

TENTATIVE ADOPTION OF 2009-2010 GROUNDFISH HARVEST SPECIFICATIONS, MANAGEMENT MEASURES, AND REBUILDING PLAN REVISIONS

Under this agenda item, the Council is scheduled to take tentative final action to: 1) adopt 2009-2010 optimum yields (OYs) and rebuilding plan revisions for depleted groundfish species; 2) consider setting aside bycatch caps for proposed 2009 Exempted Fishing Permits (EFPs) (2009 EFP applications are included in this briefing book under agenda item F.3); and 3) adopt 2009-2010 groundfish management measures. 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.7 on Thursday, followed by final adoption under Agenda Item F.9 on Friday.

Excerpted sections of a preliminary draft environmental impact statement (DEIS) are provided in Agenda Item F.4.a, Attachment 1 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. These excerpted sections include: Chapter 2 in its entirety, which describes the 2009-2010 OY alternatives, rebuilding alternatives, and 2009-2010 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. The Chapter 7 excerpts will be provided as a supplemental attachment at the Council meeting.

The California Department of Fish and Game's (CDFG's) recommendations are included in Agenda Item F.2.b, CDFG Report and CDFG Report 2. Public comments that were received at the Council office by the June briefing book deadline are included in Agenda Item F.4.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 2009-2010 OYs and management measures, and final rebuilding plan revisions. 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.7. Final Council action on 2009-2010 OYs and management measures, and rebuilding plan revisions is scheduled for Friday under Agenda Item F.9.

Council Action:

1. **Adopt Preferred 2009-2010 Optimum Yields for Depleted Groundfish Species.**
2. **Adopt Preferred Rebuilding Plan Revisions for Some Depleted Groundfish Species.**
3. **Consider Setting Aside EFP Bycatch Caps for 2009 EFPs.**
4. **Adopt Tentative Final 2009-2010 Management Measures.**

Reference Materials:

1. Agenda Item F.2.a, Attachment 1: Excerpted portions of the Preliminary Draft Environmental Impact Statement on Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2009-2010 Pacific Coast Groundfish Fishery (DEIS).
2. Agenda Item F.2.b, CDFG Report: Yelloweye Rockfish Recreational Harvest Guideline Catch-Sharing Options for the 2009-2010 Regulatory Specifications and Implications for the California Recreational Fishery.
3. Agenda Item F.2.b, CDFG Report 2: Practical Range of Management Specification Options for California's 2009-2010 Commercial and Recreational Groundfish Fisheries.
4. Agenda Item F.2.d, Public Comments.

Agenda Order:

a. Agenda Item Overview — John DeVore
b. Agency and Tribal Comments
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Tentative Adoption of 2009-2010 Final Acceptable Biological Catches (ABC), Optimum Yields (OY), Management Measures, and Revised Rebuilding Plans for Overfished Species

PFMC
05/27/08

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

There are two suites of alternatives analyzed in this EIS. The first suite of alternatives is the range of 2009-10 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 under this suite to understand the potential conservation and socioeconomic consequences of alternative depleted species' rebuilding plans. Therefore, the Council's preferred 2009-10 OY alternative serves two purposes: both as the harvest specifications for the years 2009 and 2010 and, for depleted species, as the next step in the longer term mortality schedules for rebuilding plans. Harvest specification (and rebuilding plan) alternatives are described in section 2.1.

The second suite of alternatives analyzed in this EIS is alternative 2009-10 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 2009-10 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 2009-10 management measures are described in section 2.2.

2.1 Alternative Harvest Specifications

Tables 2-1a and 2-1b depict the alternative harvest specifications for groundfish stocks and stock complexes managed under the FMP and considered by the Council for 2009 and 2010, respectively. The Council's preliminary preferred OY alternatives were decided at their April 2008 meeting. All 2009-10 ABCs adopted and recommended by the Council were recommended by the Council's Scientific and Statistical Committee (SSC). These ABCs were based on base models in the most recent assessments for assessed stocks and methodology prescribed in the Groundfish FMP for unassessed stocks.

Table 2-1a. Preliminary PFMC-recommended alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2009, including preliminary preferred alternatives. (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative			2009 Action Alternatives								
	2007 ABC a/	2008 ABC a/	2008 OY a/	2009 ABC	2010 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Preliminary preferred alternative
Lingcod - coastwide	6,706	5,853		5,278	4,829	5,205	5,278					5,278
N of 42º (OR & WA)			5,558			4,593	4,593					4,593
S of 42º (CA)			612			612	685					685
Pacific Cod	3,200	3,200	1,600	3,200	3,200	1,600						1,600
Pacific Whiting (U.S.)	612,068 (2007 U.S. & Can.)	400,000 (2008 U.S. & Can.)	269,545 (2008)	To be determined in March 2009	To be determined in March 2010	134,773	269,545	404,318				
Sablefish (Coastwide)	6,210	6,058	5,934	9,914	9,217	9,795	8,423	6,250				8,423
N of 36º (Monterey north)			5,723			9,452	7,052	5,233				7,052
S of 36º (Conception area)			210			343	1,371	1,018				1,371
PACIFIC OCEAN PERCH	900	911	150	1,160	1,173	0	130	164	189			189
Shortbelly Rockfish	13,900	13,900	13,900	6,950	6,950	3,475	6,950	-				6,950
WIDOW ROCKFISH	5,334	5,144	368	7,728	6,937	0	371	522				475
CANARY ROCKFISH	172	179	44	937	940	0	35	44	85	105	155	105
Chilipepper Rockfish	2,700	2,700	2,000	3,037	2,576	2,000	2,099	3,037				2,885
BOCACCIO	602	618	218	793	793	0	218	288				288
Splitnose Rockfish	615	615	461	615	615	461						461
Yellowtail Rockfish	4,585	4,510	4,548	4,562	4,562	4,562						4,562
Shortspine Thornyhead - coastwide	2,488	2,463		2,437	2,411							
Shortspine Thornyhead - N of 34º27'			1,634			1,608						1,608
Shortspine Thornyhead - S of 34º27'			421			414						414
Longspine Thornyhead - coastwide	3,953	3,860		3,766	3,671							
Longspine Thornyhead - N of 34º27'			2,220			2,231						2,231
Longspine Thornyhead - S of 34º27'			476			395						395
COWCOD	36	36	4	13	14	0	2	4				3
DARKBLOTCHED	456	487	290 (2007) 330 (2008)	437	440	0	159	229	300			300
YELLOWEYE	47	47	Ramp-down c/	31	32	0	13	17	15	17		17 b/
Black Rockfish (WA)	540	540	540	490	464	490						490
Black Rockfish (OR-CA)	725	719	722	1,469	1,317	920	1,000	1,469				1,000

Table 2-1a (continued). Preliminary PFMC-recommended alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2009, including preliminary preferred alternatives. (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative			2009 Action Alternatives								
	2007 ABC a/	2008 ABC a/	2007-08 OY a/	2009 ABC	2010 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Preliminary preferred alternative
Blue Rockfish (CA)	Managed under the Minor Nearshore Rockfish complexes			241	**239**	Managed under minor nearshore rockfish complexes		207	230			Managed under minor nearshore rockfish complexes
Minor Rockfish North	3,680	3,680	2,270	3,678	3,678	2,280	2,283	2,255				2,283
Nearshore Species			142			152	155	127				155
Blue rockfish contribution				28	28	25	28					28
Shelf Species			968			968						968
Slope Species			1,160			1,160						1,160
Minor Rockfish South	3,403	3,403	1,904	3,384	3,382	1,970	1,990	1,788				1,990
Nearshore Species			564			630	650	448				650
Blue rockfish contribution				213	211	182	202					202
Shelf Species			714			714						714
Slope Species			626			626						626
California scorpionfish	236	202	175	175	155	111	175					175
Cabezon (off CA only)	94	94	69	106	111	69	74	69				69
Dover Sole	28,522	28,442	16,500	29,453	28,582	16,500						16,500
English Sole	6,773	5,701	6,237	14,326	9,745	14,326						14,326
Petrale Sole (coastwide)	2,917	2,919	2,499	2,811	2,751	2,433						2,433
Arrowtooth Flounder	5,800	5,800	5,800	11,267	10,112	5,245	11,267					11,267
Starry Flounder	1,221	1,221	890	1,509	1,578	1,004						1,004
Other Flatfish	6,731	6,731	4,884	6,731	6,731	4,884						4,884
Other Fish	14,600	14,600	7,300	**TBD c/**	**TBD c/**	**TBD c/**	**TBD c/**	**TBD c/**				**TBD c/**
Longnose Skate	Managed under the Other Fish complex			3,428	3,269	901	1,349	3,428				1,349
Kelp Greenling HG (OR)			OR HG			OR HG						OR HG

a/ The Council elected to average OY projections for 2007 and 2008. ABCs were year-specific.

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/ Recalculated specifications for the Other Fish complex using new information from the longnose skate assessment will be provided in June 2008.

Table 2-1b. Preliminary PFMC-recommended alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2010, including preliminary preferred alternatives. (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative			2010 Action Alternatives								
	2007 ABC a/	2008 ABC a/	2007-08 OY a/	2009 ABC	2010 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Preliminary preferred alternative
Lingcod - coastwide	6,706	5,853		5,278	4,829	4,785	4,829					4,829
N of 42º (OR & WA)			5,558			4,173	4,173					4,173
S of 42º (CA)			612			612	656					656
Pacific Cod	3,200	3,200	1,600	3,200	3,200	1,600						1,600
Pacific Whiting (U.S.)	612,068 (2007 U.S. & Can.)	400,000 (2008 U.S. & Can.)	269,545 (2008)	To be determined in March 2009	To be determined in March 2010	134,773	269,545	404,318				
Sablefish (Coastwide)	6,210	6,058	5,934	9,914	9,217	8,988	7,729	5,777				7,729
N of 36º (Monterey north)			5,723			8,673	6,471	4,837				6,471
S of 36º (Conception area)			210			315	1,258	941				1,258
PACIFIC OCEAN PERCH	900	911	150	1,160	1,173	0	137	173	200			200
Shortbelly Rockfish	13,900	13,900	13,900	6,950	6,950	3,475	6,950	-				6,950
WIDOW ROCKFISH	5,334	5,144	368	7,728	6,937	0	362	509				475
CANARY ROCKFISH	172	179	44	937	940	0	35	44	85	105	155	105
Chilipepper Rockfish	2,700	2,700	2,000	3,037	2,576	2,000	2,099	2,576				2,447
BOCACCIO	602	618	218	793	793	0	227	302				288
Splitnose Rockfish	615	615	461	615	615	461						461
Yellowtail Rockfish	4,585	4,510	4,548	4,562	4,562	4,562						4,562
Shortspine Thornyhead - coastwide	2,488	2,463		2,437	2,411							
Shortspine Thornyhead - N of 34º27'			1,634			1,591						1,591
Shortspine Thornyhead - S of 34º27'			421			410						410
Longspine Thornyhead - coastwide	3,953	3,860		3,766	3,671							
Longspine Thornyhead - N of 34º27'			2,220			2,175						2,175
Longspine Thornyhead - S of 34º27'			476			385						385
COWCOD	36	36	4	13	14	0	2	4				3
DARKBLOTCHED	456	487	290 (2007) 330 (2008)	437	440	0	165	235	306			306
YELLOWEYE	47	47	Ramp-down c/	31	32	0	14	14	15	17		14 b/
Black Rockfish (WA)	540	540	540	490	464	464						464
Black Rockfish (OR-CA)	725	719	722	1,469	1,317	831	1,000	1,317				1,000

Table 2-1b (continued). Preliminary PFMC-recommended alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2010, including preliminary preferred alternatives. (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative			2010 Action Alternatives								
	2007 ABC a/	**2008 ABC a/**	**2007-08 OY a/**	**2009 ABC**	**2010 ABC**	**Alt 1 OY**	**Alt 2 OY**	**Alt 3 OY**	**Alt 4 OY**	**Alt 5 OY**	**Alt 6 OY**	**Preliminary preferred alternative**
Blue Rockfish (CA)	Managed under the Minor Nearshore Rockfish complexes			**241**	**239**	Managed under minor nearshore rockfish complexes		207	230			Managed under minor nearshore rockfish complexes
Minor Rockfish North	3,680	3,680	2,270	3,678	3,678	2,280	2,283	2,255				2,283
Nearshore Species			142			152	155	127				155
Blue rockfish contribution				28	28	25	28					28
Shelf Species			968			968						968
Slope Species			1,160			1,160						1,160
Minor Rockfish South	3,403	3,403	1,904	3,384	3,382	1,970	1,990	1,788				1,990
Nearshore Species			564			630	650	448				650
Blue rockfish contribution				213	211	182	202					202
Shelf Species			714			714						714
Slope Species			626			626						626
California scorpionfish	236	202	175	175	155	99	155					155
Cabezon (off CA only)	94	94	69	106	111	69	74	79				79
Dover Sole	28,522	28,442	16,500	29,453	28,582	16,500						16,500
English Sole	6,773	5,701	6,237	14,326	9,745	9,745						9,745
Petrale Sole (coastwide)	2,917	2,919	2,499	2,811	2,751	2,393						2,393
Arrowtooth Flounder	5,800	5,800	5,800	11,267	10,112	5,245	10,112					10,112
Starry Flounder	1,221	1,221	890	1,509	1,578	1,077						1,077
Other Flatfish	6,731	6,731	4,884	6,731	6,731	4,884						4,884
Other Fish	14,600	14,600	7,300	**TBD c/**	**TBD c/**	**TBD c/**	**TBD c/**	**TBD c/**				**TBD c/**
Longnose Skate	Managed under the Other Fish complex			3,428	3,269	902	1,349	3,269				1,349
Kelp Greenling HG (OR)			OR HG			OR HG						OR HG

a/ The Council elected to average OY projections for 2007 and 2008. ABCs were year-specific.

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/ Recalculated specifications for the Other Fish complex using new information from the longnose skate assessment will be provided in June 2008.

2.1.1 Alternative Harvest Levels Analyzed for Depleted Groundfish Species

Depleted groundfish species are those with spawning biomasses that have dropped below the Council's depletion or overfished threshold of 25 percent 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 percent 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 under FMP amendment 16-4 to ensure they comply with the MSA as interpreted by the courts. Amendment 16-4 was adopted in 2006 with the rebuilding plan specifications described in Table 2-2.

Table 2-2. Rebuilding plan specifications for seven depleted groundfish species adopted in 2006 under Groundfish FMP Amendment 16-4.

Species	B_0	B_{MSY}	T_{MIN} a/	T_{MAX}	$T_{F=0}$ a/	P_{MAX}	T_{TARGET}	Harvest Control Rule (SPR Harvest Rate)
Bocaccio	13,402 B eggs in 2005	5,361 B eggs	2018	2032	2021	77.70%	2026	F77.7%
Canary	34,155 mt	13,662 mt	2048	2071	2053	55.40%	2063	F88.7%
Cowcod	3,045 mt	1,218 mt	2035	2074	2035	90.60%	2039	F90.0%
Darkblotched	26,650 M eggs	10,660 M eggs	2009	2033	2010	100%	2011	F60.7%
POP	37,838 units of spawning output	15,135 units of spawning output	2015	2043	2015	92.90%	2017	F86.4%
Widow	49,678 M eggs	19,871 M eggs	2013	2033	2013	95.20%	2015	F95.0%
Yelloweye	3,322 mt	1,328 mt	2046	2096	2048	80%	2084	F71.9% b/

a/ 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. The shortest possible time to rebuild the stocks with rebuilding plans under consideration in Amendment 16-4 was $T_{F=0}$, which was the median time to rebuild the stock if all fishing-related mortality were eliminated beginning in 2007.

b/ The yelloweye rebuilding plan specifies a harvest rate ramp-down strategy before resuming a constant harvest rate in 2011. F71.9% is the constant harvest rate beginning in 2011.

No new species were declared depleted from the 16 groundfish assessments conducted in 2007. However, new stock assessments and rebuilding analyses for all of the seven depleted groundfish species were developed and adopted in 2007. Therefore, the Council is continuing rebuilding plans for the seven species only and reconsidering those plans in response to the results of new assessments and rebuilding analyses, as well as the 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 (Tables 2-1a and 2-1b). Each of these OY alternatives is based on the best available science as recommended by Stock Assessment Review (STAR) panels and the SSC. This section 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 percent 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 that it be used routinely. The rebuilding program is more thoroughly described in Chapter 6.

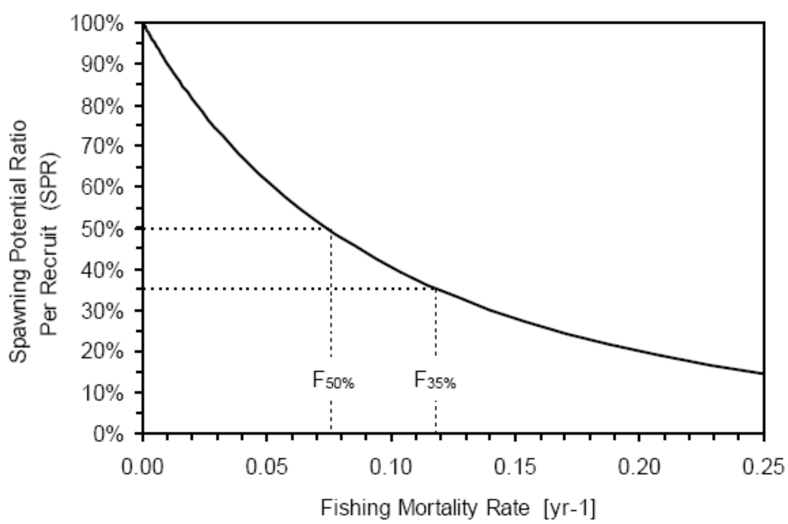

Figure 2-1. Relationship between SPR and instantaneous fishing mortality rate (F) for a hypothetical rockfish.

New rebuilding analyses for the seven depleted West Coast species using the rebuilding program were completed, reviewed by the SSC, and adopted by the Council for use in deciding 2009-10 harvest specifications for these species. This decision also implies potential revisions to the rebuilding plans adopted in 2006 under Amendment 16-4 if the preferred OY alternative changes the SPR harvest rate (harvest control rule) or the target rebuilding year (T_{TARGET}) depicted in Table 2-2. Results of the new rebuilding analyses were used to develop the depleted species' OY alternatives in Tables 2-1a and 2-1b.

Each OY alternative is described by an SPR harvest rate, a median time to rebuild, and the median time to rebuild if all fishing-related mortality were eliminated beginning in 2009 ($T_{F=0}$). Table 2-3 shows these results and Figure 2-2 graphically depicts alternative OYs vs. the associated median time predicted to rebuild these species across the range of OYs that could be considered under current National Standard 1 guidelines[1]. The range of depleted species' OYs in Tables 2-1a and 2-1b are well below the range of available yields analyzed in new rebuilding analyses and depicted in Table 2-3 and Figure 2-2.

Next, rebuilding alternatives were developed by arranging the depleted species' OYs in various combinations (Table 2-4) 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.

At their April 2008 meeting, the Council selected a preliminary preferred OY alternative for all managed groundfish species and species complexes (Table 2-1a and 2-1b). The decision of preliminary preferred OYs was made based on GMT analysis of draft rebuilding alternatives provided at the April 2008 meeting. The final Council-preferred OYs and potential rebuilding plan revisions for depleted species will be decided at the June 2008 Council meeting. The rebuilding alternatives in Table 2-4 were updated from the draft alternatives analyzed by the GMT in April 2008 using the final range of depleted species' OYs and the preliminary preferred OYs decided by the Council in April 2008. The final rebuilding alternatives in Table 2-4 are analyzed in section 4.3.1.2 of this EIS.

The final Council-preferred 2009-10 OY alternatives for depleted species must be consistent with their respective rebuilding plans. Therefore, the Council is explicitly revising any species' rebuilding plan if either the target rebuilding year (T_{TARGET}) or the SPR harvest rate in Table 2-2 is changed by Council's recommended 2009-10 OY. The Council can decide to maintain a target rebuilding year in a status quo rebuilding plan, but still specify lower 2009-10 OYs than those calculated using the status quo SPR harvest rate in the rebuilding plan. Such a decision would have the effect of increasing the probability of successfully rebuilding the stock by the target rebuilding year if the rebuilding SPR harvest rate is revised downward in the rebuilding plan without changing the target rebuilding year (i.e., a lower harvest rate is prescribed for the duration of the rebuilding plan). The choice of a final preferred OY alternative involves consideration of both short-term effects (during 2009-10) and long-term effects (the future application of rebuilding plans as revised by new stock assessments and rebuilding analyses) as discussed in section 4.3.1 in this EIS.

[1] National Standard 1 guidelines are anticipated to be amended to comply with the new mandate to end overfishing in the re-authorized Magnuson-Stevens Act enacted in 2006. Depleted species' OYs analyzed in this EIS are well below recommended ABCs; therefore, there is negligible risk of exceeding depleted species' ABCs in 2009-10. See section 4.3.1 in this EIS for more details.

Table 2-3. Estimated time to rebuild and SPR harvest rate relative to alternative 2009-2010 OYs for depleted West Coast groundfish species.

Species	Ttarget in the FMP	OY Alt.	Median Time to Rebuild	OYs (mt) 2009	OYs (mt) 2010	SPR HR	T @ F=0	Current Tmax	Re-est. Tmax
Bocaccio (S of 40°10' N lat.)	2026	1	2020	0	0	F100%	2020	2032	2033
		2	2022	218	227	F82.6%			
		3	2023	288	302	F77.7%			
		Council-pref.	2023	288	288	F77.7%			
			2026	468	482	F66.4%			
Canary	2063	1	2019	0	0	F100%	2019	2071	2035
		2	2020	35	35	F97.3%			
		3	2020	44	44	F96.2%			
			2020	55	55	F95.8%			
		4	2020	85	85	F93.6%			
			2020	95	95	F92.9%			
		5	2020	105	105	F92.2%			
		Council-pref.	2021 a/	105	105	F92.2%			
		6	2021	155	155	F88.7%			
			2023	328	325	F77.8%			
			2035	637	623	F62.0%			
Cowcod	2039	1	2061	0	0	F100%	2061	2074	2098
		2	2065	2	2	F90.0%			
		Council-pref.	2069	3	3	F83.6%			
		3	2072	4	4	F82.1%			
			2080	6	7	F69.7%			
			2089	8	8	F63.8%			
Darkblotched	2011	1	2018	0	0	F100%	2018	2033	2040
		2	2022	159	165	F75.6%			
		3	2025	229	235	F67.7%			
		Council-pref.; 4	2030	300	306	F60.7%			
			2031	318	323	F59.2%			
			2040	385	390	F53.7%			
POP	2017	1	2010	0	0	F100%	2010	2043	2042
		2	2010	130	137	F90.3%			
		3	2011	164	173	F88.0%			
		Council-pref.; 4	2011	189	200	F86.4%			
			2012	565	589	F67.8%			
			2014	744	769	F61.4%			
			2017	971	992	F54.8%			
Widow	2015	1	2009	0	0	F100%	2009	2027	2023
		2	2009	371	362	F96.4%			
		Council-pref. b/	2009	475	475	F95.7%			
		3	2009	522	509	F95.0%			
			2009	4,338	4,051	F65.0%			
Yelloweye	2084	1	2049	0	0	F100%	2049	2096	2090
		2	2082	13	14	F71.9%			
		Council-pref.; 3	2082	Ramp-down c/		F66.3% in 2009 F71.3% in 2010 d/			
		4	2090	15	15	F69.3%			
		5	2084	Ramp-down e/		F66.3% in 2009 and 2010 f/			

Table 2-3. Estimated time to rebuild and SPR harvest rate relative to alternative 2009-2010 OYs for depleted West Coast groundfish species (continued).

a/ The Council's preliminary preferred canary OY alternative has a median time to rebuild of 2020, but the Council selected a revised target rebuilding year of 2021. Therefore, the probability of rebuilding the stock by 2021 under an SPR harvest rate of F92.2% is greater than 50%.

b/ The Council did not explicitly change the status quo target rebuilding year or SPR harvest rate in the widow rockfish rebuilding plan when selecting the preliminary preferred OY alternative. This decision implies a much higher probability of rebuilding the stock by the target rebuilding year of 2015 than 50%.

c/ 2009 and 2010 OYs under the status quo harvest rate ramp-down strategy are 17 mt and 14 mt, respectively.

d/ The status quo ramp-down strategy specifies SPR harvest rates of F66.3% and F 71.3% in 2009 and 2010, respectively before assuming a constant SPR harvest rate of F71.9% beginning in 2011.

e/ The 2009 and 2010 OY under the alternative harvest rate ramp-down strategy is 17 mt, while maintaining the status quo target rebuilding year of 2084.

f/ The alternative ramp-down strategy specifies an SPR harvest rate of F66.3% in 2009 and 2010 before assuming a constant SPR harvest rate of FX% beginning in 2011.

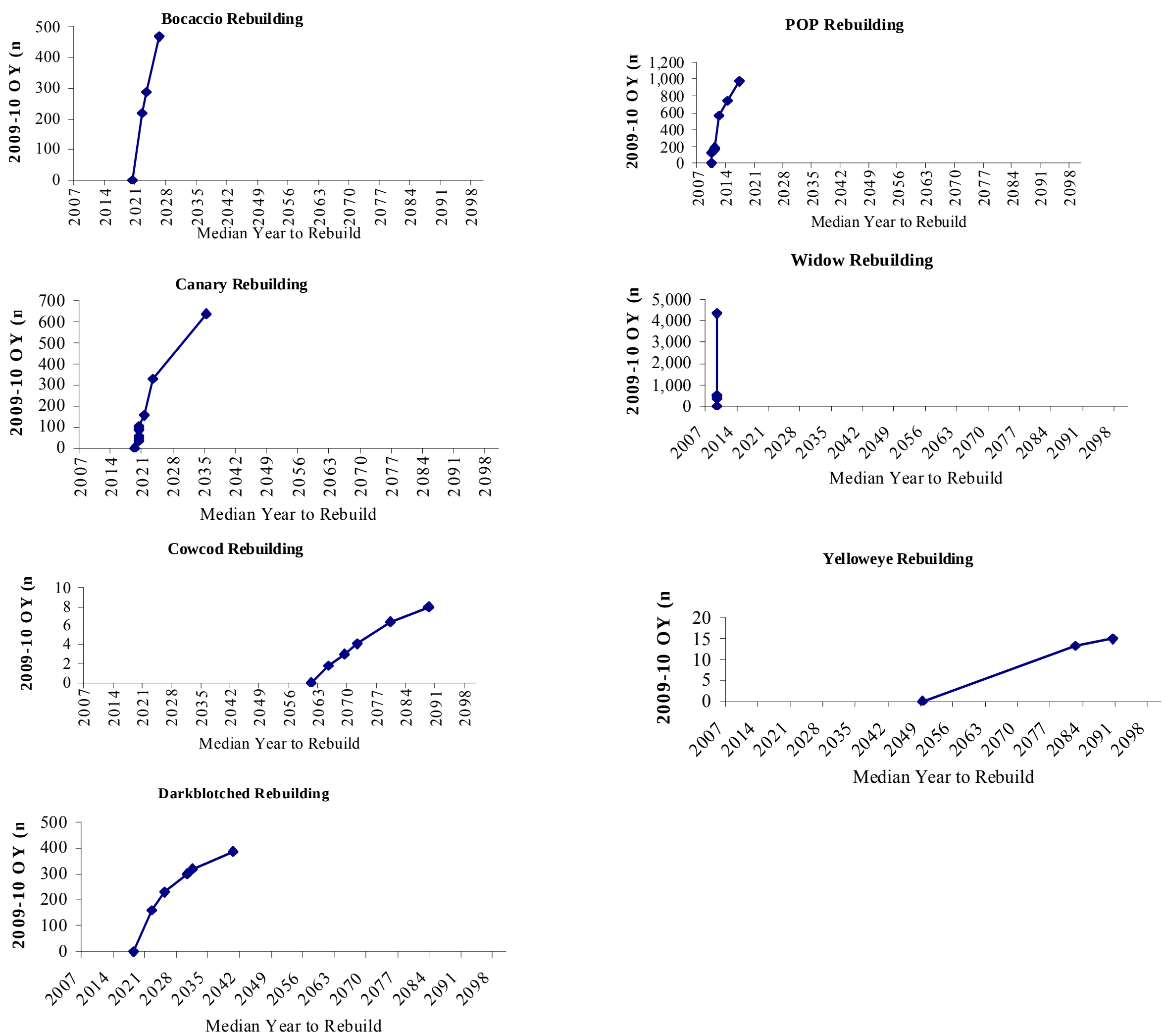

Figure 2-2. Alternative 2009-10 OYs (mt) for depleted species versus the predicted median time to rebuild the stock.

The scientific basis of each depleted species' OY alternative within the range decided by the Council for detailed analysis in April 2008 is explained in this section. Section 4.3.1 in this EIS analyzes and discusses the predicted effects of each OY alternative on the stock.

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

The SSC recommended maintaining the status quo bocaccio (*Sebastes paucispinis*) rebuilding plan adopted under Amendment 16-4 was adequate since the new assessment did not appreciably change our understanding of the stock's status from the previous assessment.

All the alternative 2009-10 OYs analyzed for bocaccio are based on the STATc base model in the 2007 assessment {MacCall 2008a}, which is an update of the 2005 assessment, and the associated 2007 rebuilding analysis {MacCall 2008b}. The OY alternatives specified for analysis for the bocaccio stock south of 40°10' N latitude are 0 mt in 2009 and 2010 (OY Alt, 1), 218 mt in 2009 and 227 mt in 2010 (OY Alt. 2), 288 mt in 2009 and 302 mt in 2010 (OY Alt. 3), and 288 mt in 2009 and 2010 (Prelim. Pref. Alt.) (Tables 2-1a, 2-1b, and 2-3). This compares to the status quo OY of 218 mt in 2007 and 2008.

The zero harvest alternative (OY Alt. 1) is predicted to rebuild the stock by 2020, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

OY Alternative 2 (218 mt in 2009 and 227 mt in 2010) is based on the SPR harvest rate predicted to produce the 2007-2008 OY of 218 mt (in 2009 in this case), which is F82.6%. This harvest rate is lower than the status quo SPR harvest rate of F77.7% in the current bocaccio rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 91.5%. The median time to rebuild the stock under this alternative is 2022, or two years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

OY Alternative 3 (288 mt in 2009 and 302 mt in 2010) is based on the status quo SPR harvest rate of F77.7% in the current bocaccio rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 88.8%. The median time to rebuild the stock under this alternative is 2023, or three years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The Council's preliminary preferred bocaccio OY alternative is 288 mt in 2009 and 2010. The Council elected to maintain the status quo target rebuilding year of 2026 and SPR harvest rate (F77.7%) in the current bocaccio rebuilding plan. The probability of rebuilding the bocaccio stock by the target rebuilding year is much greater than 50% given that an SPR harvest rate of F77.7% has a median or 50% probability of rebuilding by 2023 and a 2010 OY of 288 mt is based on a lower SPR harvest rate than F77.7%.

2.1.1.2 *Canary Rockfish*

The SSC recommended revising the status quo canary rockfish (*Sebastes pinniger*) rebuilding plan adopted under Amendment 16-4 since the new assessment fundamentally changed our understanding of stock productivity. All the alternative 2009-10 OYs analyzed for canary rockfish are based on the base model in the new 2007 assessment {Stewart 2008a} and the associated 2007 rebuilding analysis {Stewart 2008b}. The new assessment and rebuilding analysis indicate that canary rebuilding is 42 years ahead of schedule under the status quo SPR harvest rate of F88.7% (2021 vs. 2063; Tables 2-2 and 2-3).

The OY alternatives specified for analysis for the coastwide canary rockfish stock are 0 mt in 2009 and 2010 (OY Alt. 1), 35 mt in 2009 and 2010 (OY Alt. 2), 44 mt in 2009 and 2010 (OY Alt. 3), 85 mt in 2009 and 2010 (OY Alt. 4), 105 mt in 2009 and 2010 (OY Alt. 5; Prelim. Pref. Alt.), and 155 mt in 2009 and 2010 (OY Alt. 6) (Tables 2-1a, 2-1b, and 2-3). This compares to the status quo OY of 44 mt in 2007 and 2008.

The zero harvest alternative (OY Alt. 1) is predicted to rebuild the stock by 2019, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

OY Alternative 2 (35 mt in 2009 and 2010) is based on an SPR harvest rate of F97.3%. This harvest rate is lower than the status quo SPR harvest rate of F88.7% in the current canary rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 75%. The median time to rebuild the stock under this alternative is 2020, or one year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

OY Alternative 3 (85 mt in 2009 and 2010) is based on the SPR harvest rate predicted to produce the 2007-2008 OY, which is F96.2%. This harvest rate is lower than the status quo SPR harvest rate of F88.7% in the current canary rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 75%. The median time to rebuild the stock under this alternative is 2020, or one year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

OY Alternative 4 (44 mt in 2009 and 2010) is based on an SPR harvest rate of F93.6%. This harvest rate is lower than the status quo SPR harvest rate of F88.7% in the current canary rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 75%. The median time to rebuild the stock under this alternative is 2020, or one year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

OY Alternative 5 (105 mt in 2009 and 2010) is based on an SPR harvest rate of F92.2%. This harvest rate is lower than the status quo SPR harvest rate of F88.7% in the current canary rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 75%. The median time to rebuild the stock under this alternative is 2020, or one year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The Council's preliminary preferred canary OY alternative is the same as OY Alternative 5 in terms of the actual 2009-10 OY. However, the Council decided to specify a target rebuilding year of 2021, which is one year longer than the median rebuilding time predicted under OY Alternative 5 and two years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2). The target rebuilding year of 2021 under the Council's preliminary preferred revised rebuilding plan also maintains the status quo SPR harvest rate of F88.7% in the current canary rebuilding plan. If the lower harvest rate in OY Alternative 5 was maintained through the entire course of rebuilding, the probability of rebuilding by 2021 would be greater than 50%. The predicted probability of rebuilding the stock in the maximum allowable time under the status quo SPR harvest rate is 75%.

OY Alternative 6 (155 mt in 2009 and 2010) is based on the status quo SPR harvest rate of F88.7% in the current canary rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under the status quo SPR harvest rate is 75%. The median time to rebuild the stock under this alternative is 2021, or two years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

2.1.1.3 *Cowcod*

The SSC recommended revising the cowcod (*Sebastes levis*) rebuilding plan since the new 2007 rebuilding analysis {Dick and Ralston 2008}, based on the new 2007 assessment {Dick, *et al.* 2008}, indicated rebuilding progress is 26 years behind schedule under the status quo SPR harvest rate of F90.0% (2069 vs. 2039; Tables 2-2 and 2-3). The new cowcod assessment corrected technical flaws in the 2005 assessment (Piner, *et al.* 2006), which informed the Amendment 16-4 rebuilding plan described in Table 2-2. Dick and Ralston (2008) report the shortest time to rebuild the stock under a zero-harvest strategy beginning in 2009 ($T_{F=0}$) is 2061 and maintaining the current rebuilding year in the rebuilding plan (2039; Table 2-2) under a zero-harvest strategy has an estimated 21.6% rebuilding probability (P_{MAX}).

All the alternative 2009-10 OYs analyzed for cowcod are based on the base model in the new assessment and rebuilding analysis. Cowcod OY alternatives considered in this EIS apply to fisheries in the Conception and Monterey INPFC areas. However, the new assessment and rebuilding analysis, as well all preceding cowcod assessments and rebuilding analyses, pertain only to the portion of the stock occurring in the Conception area. The convention recommended by the GMT and adopted by the Council since the cowcod stock was first declared overfished or depleted in 2000 is to double the Conception area OY to account for fisheries in the Monterey area.

The OY alternatives specified for analysis for the cowcod stock are 0 mt in 2009 and 2010 (OY Alt. 1), 2 mt in 2009 and 2010 (OY Alt. 2), 3 mt in 2009 and 2010 (Prelim. Pref. Alt.), and 4 mt in 2009 and 2010 (OY Alt. 3) (Tables 2-1a, 2-1b, and 2-3). This compares to the status quo OY of 4 mt in 2007 and 2008.

The zero harvest alternative (OY Alt. 1) is predicted to rebuild the stock by 2061, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity. The predicted probability of rebuilding the stock in the maximum allowable time is 78.4% under the zero harvest alternative.

OY Alternative 2 (2 mt in 2009 and 2010) is based on the status quo SPR harvest rate of F90.0% in the current cowcod rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under the status quo SPR harvest rate is 72.4%. The median time to rebuild the stock under this alternative is 2065, or four years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The Council's preliminary preferred cowcod OY alternative of 3 mt in 2009 and 2010 is based on a higher SPR harvest rate (F83.6%) than status quo; although the OY is lower than the status quo 4 mt. The predicted probability of rebuilding the stock in the maximum allowable time under the preliminary preferred OY alternative is 72.4%. The median time to rebuild the stock under this alternative is 2069, or eight years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2). The Council deferred their decision on revised cowcod rebuilding plan parameters until June 2008 since a 3 mt alternative was not analyzed in the original 2007 cowcod rebuilding analysis. The parameters presented here are based on the updated rebuilding analysis provided subsequent to the April 2008 meeting when the preliminary preferred OY alternative was decided.

OY Alternative 3 (4 mt in 2009 and 2010) is based on the SPR harvest rate predicted to produce the 2007-2008 OY, which is F82.1%. This harvest rate is lower than the status quo SPR harvest rate of F90.0% in the current cowcod rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 66.2%. The median time to rebuild the stock under this alternative is 2072, or eleven years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

2.1.1.4 *Darkblotched Rockfish*

The SSC recommended revising the status quo darkblotched rockfish (*Sebastes crameri*) rebuilding plan adopted under Amendment 16-4 since the new assessment fundamentally changed our understanding of stock productivity. In fact, the status quo target rebuilding year of 2011 in the current darkblotched rebuilding plan cannot be achieved even under a zero harvest rebuilding strategy; $T_{F=0}$ is now estimated to be 2018 (Table 2-3). All the alternative 2009-10 OYs analyzed for darkblotched rockfish are based on the base model in the new 2007 assessment {Hamel 2008a} and the associated 2007 rebuilding analysis {Hamel 2008b}. The new assessment and rebuilding analysis indicate that darkblotched rebuilding is 19 years behind schedule under the status quo SPR harvest rate of F60.7% (2030 vs. 2011; Tables 2-2 and 2-3).

The OY alternatives specified for analysis for the coastwide darkblotched rockfish stock are 0 mt in 2009 and 2010 (OY Alt. 1), 159 mt in 2009 and 165 mt in 2010 (OY Alt. 2), 229 mt in 2009 and 235 mt in 2010 (OY Alt. 3), and 300 mt in 2009 and 306 mt in 2010 (Prelim. Pref. Alt.) (Tables 2-1a, 2-1b, and 2-3). This compares to the status quo OY of 290 mt in 2007 and 330 mt in 2008.

The zero harvest alternative (OY Alt. 1) is predicted to rebuild the stock by 2018, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

OY Alternative 2 (159 mt in 2009 and 165 mt in 2010) is based on an SPR harvest rate of F75.6%. This harvest rate is lower than the status quo SPR harvest rate of F60.7% in the current darkblotched rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 97.7%%. The median time to rebuild the stock under this alternative is 2022, or four years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

OY Alternative 3 (229 mt in 2009 and 235 mt in 2010) is based on an SPR harvest rate of F67.7%. This harvest rate is lower than the status quo SPR harvest rate of F60.7% in the current darkblotched rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 91.0%. The median time to rebuild the stock under this alternative is 2025, or seven years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The Council's preliminary preferred OY alternative is OY Alternative 4 (300 mt in 2009 and 306 mt in 2010) and is based on the status quo SPR harvest rate of F60.7%. While the Council is recommending maintaining the SPR harvest rate in the current rebuilding plan, they are recommending a revised target rebuilding year of 2030, which is the median year to rebuild the stock under the status quo harvest rate. The predicted probability of rebuilding the stock in the maximum allowable time under the status quo harvest rate is 76.7%. The median time to rebuild the stock under this alternative is 2030, or twelve years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

2.1.1.5 *Pacific Ocean Perch*

The SSC recommended maintaining the status quo Pacific ocean perch (*Sebastes alutus*; POP) rebuilding plan adopted under Amendment 16-4 was adequate since the new assessment did not appreciably change our understanding of the stock's status from the previous assessment.

All the alternative 2009-10 OYs analyzed for POP are based on the base model in the updated 2007 assessment {Hamel 2008c} and the associated 2007 rebuilding analysis {Hamel 2008d}. The OY alternatives specified for analysis for the coastwide POP stock are 0 mt in 2009 and 2010 (OY Alt, 1), 130 mt in 2009 and 137 mt in 2010 (OY Alt. 2), 164 mt in 2009 and 173 mt in 2010 (OY Alt. 3), and

189 mt in 2009 and 200 mt in 2010 (OY Alt. 4; Prelim. Pref. Alt.) (Tables 2-1a, 2-1b, and 2-3). This compares to the status quo OY of 150 mt in 2007 and 2008.

The zero harvest alternative (OY Alt. 1) is predicted to rebuild the stock by 2020, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

OY Alternative 2 (130 mt in 2009 and 137 mt in 2010) is based on an SPR harvest rate of F90.3%. This harvest rate is lower than the status quo SPR harvest rate of F86.4% in the current POP rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 95.6%. The median time to rebuild the stock under this alternative is 2010; no longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

OY Alternative 3 (164 mt in 2009 and 173 mt in 2010) is based on an SPR harvest rate of F88.0%. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 95.0%. The median time to rebuild the stock under this alternative is 2011, or one year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The Council's preliminary preferred POP OY alternative is OY Alternative 4 (189 mt in 2009 and 200 mt in 2010). The Council elected to maintain the status quo target rebuilding year of 2017 and the SPR harvest rate (F86.4%) in the current POP rebuilding plan. The probability of rebuilding the POP stock by the target rebuilding year of 2017 is much greater than 50% given that an SPR harvest rate of F86.4% has a predicted median year to rebuild of 2011.

2.1.1.6 *Widow Rockfish*

All 2009-10 OY alternatives for widow rockfish (*Sebastes entomelas*) are based on the 2007 assessment {He, *et al.* 2008a}, which is an update of the 2005 assessment, and the new 2007 rebuilding analysis {He, *et al.* 2008b}, which is based on the 2007 updated assessment. The SSC noted that the new assessment and rebuilding analysis indicated the stock was on track to rebuild in the next management cycle (2009) due to low catches since the stock was declared overfished and recruitment of the strong 1999 year class into the spawning population. The rebuilding outlook is well ahead of the scheduled target rebuilding year of 2015. All widow OY alternatives analyzed in this EIS are predicted to rebuild the stock by 2009.

The zero harvest alternative (OY Alt. 1) is predicted to rebuild the stock by 2009, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

OY Alternative 2 (371 mt in 2009 and 362 mt in 2010) is based on the SPR harvest rate predicted to produce the 2007-2008 OYs, which is F96.4% and lower than the status quo SPR harvest rate of F95% in the current widow rebuilding plan. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 100%. The median time to rebuild the stock under this alternative is 2009; no longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The Council's preliminary preferred widow OY alternative is 475 mt in 2009 and 2010. The Council elected to maintain the status quo target rebuilding year of 2015, although the SPR harvest rate would be revised downward to F95.7%. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 100%. The median time to rebuild the stock under this alternative is 2009; no longer than $T_{F=0}$ (Table 2-3 and Figure 2-2). The probability of recovering the stock by 2015 is 100%; however, as the SSC cautioned, a new full assessment in 2009 will be needed to verify this result.

OY Alternative 3 (522 mt in 2009 and 509 mt in 2010) is based on the status quo SPR harvest rate of F95.0%. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 100%. The median time to rebuild the stock under this alternative is 2009; no longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

2.1.1.7 *Yelloweye Rockfish*

The 2009-10 OY alternatives for yelloweye rockfish (*Sebastes ruberrimus*) are based on the 2007 assessment {Wallace 2008a}, which is an update of the 2006 assessment, and the 2007 rebuilding analysis {Wallace 2008b}, which is based on the 2007 updated assessment. The 2007 updated assessment did not significantly change our understanding of stock productivity, although the median time to rebuild under the status quo harvest rate ramp-down strategy is now predicted to be 2082 instead of 2084, largely due to a higher assumed natural mortality rate. The Council added an alternative harvest rate ramp-down strategy to the analysis in April 2008. While the original 2007 yelloweye rebuilding analysis did not analyze this alternative, it is anticipated that this analysis will get done before the June 2008 Council meeting, when the Council will decide final 2009-10 yelloweye OYs and decide whether to revise the status quo rebuilding plan.

The zero harvest alternative (OY Alt. 1) is predicted to rebuild the stock by 2049, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

OY Alternative 2 (13 mt in 2009 and 14 mt in 2010) is based on specifying the constant SPR harvest rate of F71.9% beginning in 2009 rather than 2011, which is when the status quo yelloweye rebuilding plan assumes that constant harvest rate. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 69.5%. The median time to rebuild the stock under this alternative is 2082, which is 33 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The Council's preliminary preferred yelloweye OY alternative is OY alternative 3, which is the status quo harvest rate ramp-down strategy and which specifies a 17 mt OY in 2009 and a 14 mt OY in 2010. The status quo harvest rate ramp-down strategy specifies SPR harvest rates of F66.3% and F71.3% in 2009 and 2010, respectively before assuming a constant SPR harvest rate of F71.9% beginning in 2011. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative is 68.9%. The median time to rebuild the stock under this alternative is 2082, which is 33 years longer than $T_{F=0}$, but two years shorter than the target rebuilding year of 2084 in the status quo yelloweye rebuilding plan (Table 2-3 and Figure 2-2).

OY Alternative 4 (15 mt in 2009 and 2010) is based on a constant quo SPR harvest rate of F69.3%. The predicted probability of rebuilding the stock in the maximum allowable time under this alternative harvest rate is 50%, which is the lowest probability allowed by federal court precedent. The median time to rebuild the stock under this alternative is 2090, which is 41 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

OY Alternative 5 is the alternative harvest rate ramp-down strategy decided for analysis at the April 2008 Council meeting. This alternative specifies a 17 mt OY in 2009 and 2010 under an SPR harvest rate of F66.3%, before resuming a constant SPR harvest rate of FX% *(note: this value will be provided at the June 2008 Council meeting)*. This alternative maintains the target rebuilding year of 2084 in the status quo yelloweye rebuilding plan, with a 50% probability. Therefore, the median time to rebuild the stock is 2084, which is 35 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

2.1.1.8 *Rebuilding Alternatives*

Rebuilding alternatives are strategically constructed suites of depleted species' OYs designed by the GMT to show how the available yields of these species constrain fishing opportunities by sector alternatively north and south of 40°10' N latitude and on the continental shelf and slope. Ranging rebuilding alternatives this way also reveals how different sectors are differentially constrained by the available yields of these species since sector harvest impacts are a function of the selectivity of the gears used in each sector. Management measures by sector and the corresponding impacts associated with each of these rebuilding alternatives are indicative of potential impacts to West Coast fishing communities, which are a useful measure of socioeconomic consequences of alternative rebuilding plans. The GMT originally presented their analysis of rebuilding alternatives at the April 2008 Council meeting, which aided the Council in deciding the preliminary preferred OYs depicted in Tables 2-1a and 2-1b for depleted groundfish species.

The original rebuilding alternatives analyzed by the GMT in April 2008 were designed using the original range of depleted species' OYs decided by the Council in November 2007 and those OY alternatives proposed early in the April 2008 Council meeting for initial analysis. The final rebuilding alternatives depicted in Table 2-4 use the final range of depleted species' OYs ultimately decided for analysis by the Council in April 2008, including the preliminary preferred 2009-10 OYs, but not the zero harvest alternatives.

Table 2-4. Rebuilding alternatives strategically structured to vary the available 2009-10 yields (mt) of depleted species north and south of 40°10' N latitude and on the continental shelf and slope. The Council's preliminary-preferred 2009-10 OY alternatives are also shown.

Area	Species	Shelf to Slope Impacts (OYs in mt)						Council Prelim.-Pref. Alt. (2009)	Council Prelim.-Pref. Alt. (2010)
		Higher-Lower	Lower-Higher	Lower-Lower	Higher-Higher	Mixed			
		Reb. Alt. 1	Reb. Alt. 2	Reb. Alt. 3	Reb. Alt. 4	Reb. Alt. 5a	Reb. Alt. 5b		
Northern Shelf	Canary	155	44	44	155	85	105	105	105
	Yelloweye	17	14	13	17	17	17	17	14
Southern Shelf	Bocaccio	288	218	218	288	218	218	288	288
	Cowcod	4	2	2	4	2	2	3	3
Slope	POP	130	189	130	189	164	164	189	200
	Darkblotched	159	300	159	300	300	300	300	306
Pelagic	Widow	522	371	371	522	371	522	475	475

Rebuilding Alternative 1 is designed to allow more fishing opportunities on the continental shelf north and south of 40°10' N latitude by specifying relatively higher OYs for bocaccio, canary rockfish, cowcod, widow rockfish and yelloweye rockfish, while allowing fewer fishing opportunities on the slope by specifying relatively lower OYs for darkblotched rockfish and POP.

Rebuilding Alternative 2 is conversely designed to allow fewer fishing opportunities on the shelf north and south of 40°10' N latitude by specifying relatively lower OYs for the shelf species (bocaccio, canary, cowcod, widow, and yelloweye), and higher fishing opportunities on the slope by specifying relatively higher OYs for the slope species (darkblotched and POP).

Rebuilding Alternative 3 is the most restrictive coastwide since it is constructed with relatively low OYs for all the depleted species.

Rebuilding Alternative 4 is the most liberal coastwide since it is constructed with relatively high OYs for all the depleted species.

Rebuilding Alternatives 5a and 5b allow mixed fishing opportunities by sector north and south of 40°10' N latitude and in shallow and deeper waters and are designed to show further trade-offs between rebuilding OYs that may not be captured by rebuilding alternatives 1 through 4.

2.1.2 Alternative Harvest Levels Analyzed for Precautionary Zone Groundfish Species

Groundfish species in the precautionary zone are those with spawning biomasses that are below the Council's target MSY biomass of 40% of estimated initial biomass (or $B_{40\%}$), but above the depletion threshold of $B_{25\%}$. Spawning biomasses for such stocks have not declined below the depletion threshold since the biomass-based management framework was implemented in the Groundfish FMP under Amendment 11 in 1998. Depleted stocks managed under rebuilding plans that have a currently estimated spawning biomass above $B_{25\%}$, but have not attained the target $B_{40\%}$ biomass are still considered depleted stocks, not precautionary zone stocks.

The Groundfish FMP has a default OY rule that calls for a precautionary reduction of the OY from the ABC when a stock's spawning biomass drops below $B_{40\%}$ (Figure 2-3). This rule, called the "default 40-10 adjustment", mandates a decrease of the harvest rate below that estimated to produce an equilibrium biomass at MSY (denoted F_{MSY}) when setting an OY for a stock with a spawning biomass below $B_{40\%}$. The harvest rate reduction increases linearly the farther below $B_{40\%}$ the stock's spawning biomass is estimated to be until, at $B_{10\%}$, the OY is set to zero. The 40-10 adjustment is designed to increase the stock's spawning biomass to the target $B_{40\%}$ level. While this default OY rule can be used as an interim rebuilding strategy until a formal rebuilding plan is developed for a stock declared overfished or depleted, it is more commonly the default OY rule used to set harvest specifications for precautionary zone species.

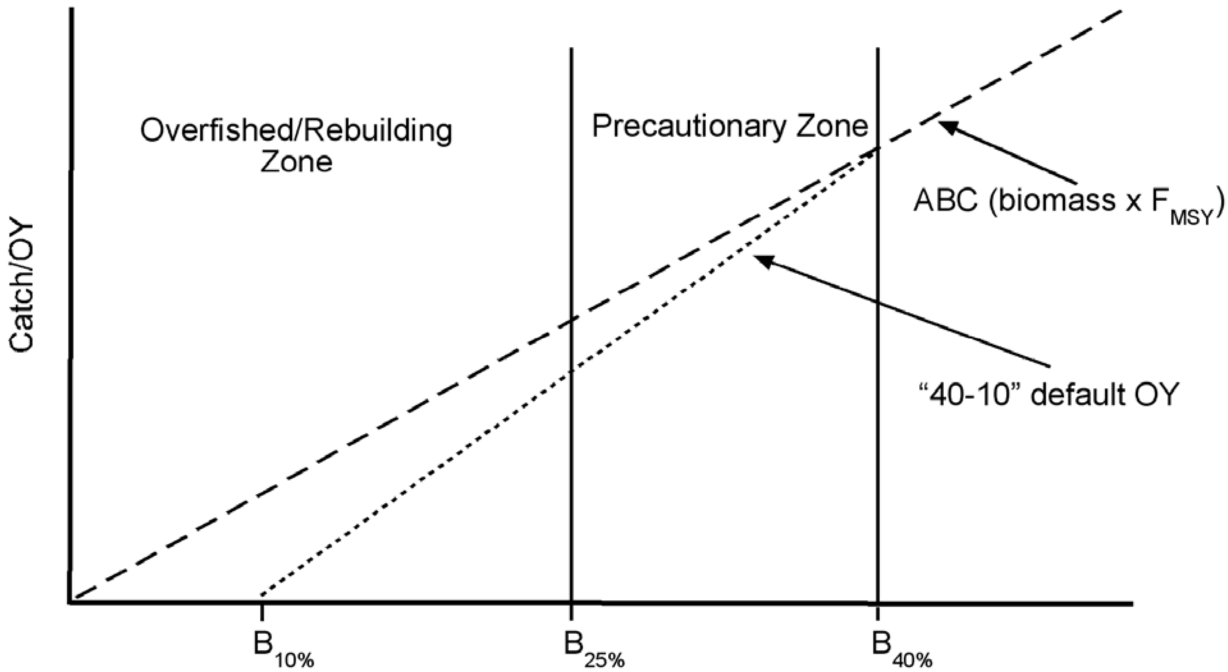

Figure 2-3. Illustration of the default OY rule compared to the ABC.

2.1.2.1 *Blue Rockfish (in Waters off California)*

The first blue rockfish assessment on the West Coast was conducted in 2007 for the portion of the stock occurring in waters off California north of Pt. Conception {Key, *et al.* 2008}. The base model in the assessment estimated spawning stock biomass at 29.7% of initial, unfished biomass in 2007; therefore, the stock is considered in the precautionary zone. There are two 2009-10 OY alternatives that contemplate managing blue rockfish off California with species-specific harvest specifications (OY alternatives 3 and 4) and two OY alternatives that contemplate continuing to manage blue rockfish in the minor nearshore rockfish complexes north and south of 40°10' N latitude (OY alternatives 1 and 2; see section 2.1.4 for a description of these two OY alternatives). All four OY alternatives are based on results from the new assessment.

OY Alternative 3 (207 mt in 2009 and 2010) would apply to the portion of the stock occurring off California and is based on the 40-10 adjusted harvestable yield from the assessment base model using an F50% harvest rate for the assessed portion of the California stock north of Pt. Conception at 34°27' N latitude plus 9 mt for the contribution to the OY south of Pt. Conception. The south of Pt. Conception portion of the OY (9 mt) is a 50% adjustment of the original ABC contribution of blue rockfish to the southern minor nearshore rockfish complex (18 mt), which represents the average 1994-99 harvest of blue rockfish in those waters.

OY Alternative 4 (230 mt in 2009 and 2010) would apply to the portion of the stock occurring off California and is based on setting the north of Pt. Conception OY equal to the ABC using the high productivity model (high natural mortality) from the new assessment as constrained by the base model ABC plus 9 mt for the contribution to the OY south of Pt. Conception. The south of Pt. Conception portion of the OY (9 mt) is a 50% adjustment of the original ABC contribution of blue rockfish to the southern minor nearshore rockfish complex (18 mt), which represents the average 1994-99 harvest of blue rockfish in those waters.

2.1.2.2 *Cabezon (in Waters off California)*

All cabezon (*Scorpaenichthys marmoratus*) OY alternatives are based on the most recent cabezon assessment, which was done for the portion of the stock occurring in waters off California in 2005 (Cope and Punt 2006). The assessment stratified analyses for two substocks, north and south of Pt. Conception at 34°27' N latitude, with an estimated spawning output for the northern California substock of $B_{40.1\%}$ and $B_{28.3\%}$ for the southern California substock. Since the two substocks collectively have an estimated spawning output less than $B_{40\%}$, cabezon in waters off California are considered a precautionary zone stock.

OY Alternative 1 (69 mt in 2009 and 2010) is the status quo OY and is based on the average of the 2007 and 2008 OYs projected in the 2005 assessment using an F50% harvest rate with a 60-20 adjustment. The 60-20 adjustment is analogous to the Council's default 40-10 rule, where, in this case, the OY equals the ABC at spawning biomasses ≥60% of initial biomass and sequentially reduced from the ABC until, at 20% of initial biomass, the OY is set to zero.

OY Alternative 2 (74 mt in 2009 and 2010) is based on the average of the 2009 and 2010 OYs projected in the 2005 assessment using an F50% harvest rate with the 60-20 adjustment.

The preliminary preferred OY Alternative is OY Alternative 3 (69 mt in 2009 and 79 mt in 2010), which are the year-specific 2009 and 2010 OYs projected in the 2005 assessment using an F50% harvest rate with the 60-20 adjustment.

2.1.2.3 *Petrale Sole*

The most recent petrale sole (*Eopsetta jordani*) assessment was done in 2005 (Lai, *et al.* 2006). The portion of the stock in the northern assessment area (Columbia and U.S.-Vancouver INPFC areas) had an estimated spawning stock biomass of $B_{34\%}$ in 2005 and the portion of the stock in the southern assessment area (Conception, Monterey, and Eureka INPFC areas) had an estimated spawning stock biomass of $B_{29\%}$ in 2005. Since the stock's spawning biomass is less than $B_{40\%}$, this is considered a precautionary zone stock.

Only one alternative OY alternative was considered for petrale sole for 2009-10. The OY was projected from the 2005 assessment using the same methodology as used for the final preferred OY alternative in 2007-08. The 2009-10 OY (2,433 mt in 2009 and 2,393 mt in 2010) is based on the sum of the 40-10 adjusted northern OY and 75% of the 40-10 adjusted southern OY. The southern OY has a 75% precautionary adjustment due to greater assessment uncertainty.

2.1.2.4 *Sablefish*

All 2009-10 sablefish OY alternatives are based on a new assessment of the coastwide stock conducted in 2007 {Schirripa 2008}. While the new assessment indicates stock status has improved since the last assessment in 2005, stock depletion was estimated to be at 38.3% of initial, unfished biomass and still in the precautionary zone. As has been standard practice, all alternatives apportion the coastwide OY north and south of 36° N latitude since all commercial allocations are currently based on the proportion of the harvestable surplus of sablefish north of 36° N latitude.

OY Alternative 1 (9,795 mt coastwide, 9,452 mt north of 36° N latitude, and 343 mt south of 36° N latitude in 2009; and 8,988 mt coastwide, 8,673 mt north of 36° N latitude, and 315 mt south of 36° N latitude in 2010) is based on the 40-10 adjusted yield projected from the base model in the new assessment. The coastwide OY was apportioned north and south of 36° N latitude using the status quo method of applying the average proportion of 2000-01 landings of sablefish north of 36° N latitude (96.5%) and south of 36° N latitude (3.5%).

The preliminary preferred sablefish OY is OY Alternative 2 (8,423 mt coastwide, 7,052 mt north of 36° N latitude, and 1,371 mt south of 36° N latitude in 2009; and 7,729 mt coastwide, 6,471 mt north of 36° N latitude, and 1,258 mt south of 36° N latitude in 2010). OY Alternative 2 is developed starting with the 40-10 adjusted coastwide yield projected from the base model of the new assessment. The coastwide yield is then apportioned north and south of 36° N latitude using the average 2003-06 proportions of the swept-area biomass estimates of sablefish from the NWFSC shelf-slope trawl survey. The average proportions of sablefish biomass distribution are 72% north of 36° N latitude and 28% in the Conception area south of 36° N latitude. The Conception area OY is then adjusted by 50% to account for greater assessment and survey uncertainty south of 36° N latitude. The northern and southern OYs are then summed to derive the coastwide OY.

OY Alternative 3 (6,250 mt coastwide, 5,233 mt north of 36° N latitude, and 1,018 mt south of 36° N latitude in 2009; and 5,777 mt coastwide, 4,837 mt north of 36° N latitude, and 941 mt south of 36° N latitude in 2010) is based on the more conservative low abundance model in the new sablefish assessment with a 40-10 adjustment and the same area apportionment methodology used to derive OY Alternative 2 specifications.

2.1.3 Alternative Harvest Levels Analyzed for Healthy Groundfish Species

Healthy groundfish species are those with estimated spawning biomasses at or greater than the B_{MSY} proxy of 40% of initial, unfished biomass. Current National Standard 1 guidelines allow OYs to be set equal to ABCs for healthy stocks, although these guidelines may change in the near future. National Standard 1 guidelines are anticipated to change in response to the re-authorized Magnuson-Stevens Act mandate to end overfishing, which may prescribe a precautionary reduction of the OY from the ABC for healthy stocks to minimize the risk of overfishing. However, a proposed rule for new National Standard 1 guidelines has yet to be published. Given that regional management councils will have a year to amend FMPs after the final rule for new National Standard 1 guidelines is published, it is expected that these new guidelines will be used in setting 2011 and 2012 groundfish harvest specifications.

2.1.3.1 *Arrowtooth Flounder*

All arrowtooth flounder OY alternatives are based on a new arrowtooth flounder assessment conducted in 2007 {Kaplan and Helser 2008}. The new assessment concluded the West Coast arrowtooth flounder stock was healthy with a spawning biomass estimated at 79% of its initial, unfished biomass in 2007.

OY Alternative 1 (5,245 mt in 2009 and in 2010) for arrowtooth flounder is based on the estimated equilibrium MSY under the proxy SPR harvest rate of F40%.

The preliminary preferred OY Alternative is OY Alternative 2 (11,267 in 2009 and 10,112 mt in 2010), which is based on the estimated ABC for the stock. An OY equal to the ABC is allowed under the FMP for healthy stocks, such as arrowtooth flounder when the spawning biomass is equal to or greater than 40% of its initial, unfished level. The new assessment estimated that the spawning biomass of arrowtooth flounder at the beginning of 2007 was 79% of its initial, unfished level.

These alternative OYs compare to the status quo 2007-08 ABC/OY of 5,800 mt.

2.1.3.2 *Black Rockfish (in Waters off Oregon and California)*

All 2009-10 black rockfish (*Sebastes melanops*) harvest specifications are derived using new 2007 assessments. Assessments for the southern portion of the West Coast black rockfish stock south of Cape Falcon, Oregon {Sampson 2008} and the northern portion of the West Coast black rockfish stock north of Cape Falcon, Oregon {Wallace, *et al.* 2008} were used to derive southern harvest specifications for fisheries off Oregon and California and northern harvest specifications for fisheries off Washington. Both assessments indicate a healthy West Coast black rockfish resource with the portion of the stock south of Cape Falcon estimated to be at 70% of its initial, unfished biomass and the portion of the stock north of Cape Falcon estimated to be at 53.4% of its initial, unfished biomass. This section describes the OY alternatives for the portion of the stock occurring in waters off Oregon and California.

OY Alternative 1 (920 mt in 2009 and 831 mt in 2010) is based on results under the low productivity model in the southern assessment for the portion of the stock south of Cape Falcon. An additional yield for the portion of the stock occurring in Oregon waters north of Cape Falcon is added to the OY using 3% of the northern black rockfish OY from the base model of the northern assessment. The 3% apportionment is based on the estimated proportion of catch from waters off Oregon north of Cape Falcon relative to the entire area between Cape Falcon and the U.S.-Canada border.

The preliminary preferred OY alternative is OY Alternative 2 (1,000 mt in 2009 and 2010). Alternative projections using constant catch scenarios of 800 mt; 1,000 mt; and 1,200 mt were requested by the GMT to better inform a low OY alternative. Of these, the GMT recommended analysis of the 1,000 mt constant catch scenario since projected stock depletion under that scenario was intermediate to the low and base case OY alternatives in the assessment's decision table.

OY Alternative 3 (1,469 mt in 2009 and 1,317 mt in 2010) is based on the medium productivity base case model in the southern assessment with the same apportionment methodology to account for the portion of the stock in Oregon waters north of Cape Falcon as described under OY Alternative 1.

2.1.3.3 *Black Rockfish (in Waters off Washington)*

All 2009-10 black rockfish (*Sebastes melanops*) harvest specifications are derived using new 2007 assessments. Assessments for the southern portion of the West Coast black rockfish stock south of Cape Falcon, Oregon {Sampson 2008} and the northern portion of the West Coast black rockfish stock north of Cape Falcon, Oregon {Wallace, *et al.* 2008} were used to derive southern harvest specifications for fisheries off Oregon and California and northern harvest specifications for fisheries off Washington. Both assessments indicate a healthy West Coast black rockfish resource with the portion of the stock south of Cape Falcon estimated to be at 70% of its initial, unfished biomass and the portion of the stock north of Cape Falcon, Oregon estimated to be at 53.4% of its initial, unfished biomass. This section describes the OY alternatives for the portion of the stock occurring in waters off Washington.

Only one OY alternative is considered for the black rockfish stock occurring in waters off Washington; therefore, OY Alternative 1 (490 mt in 2009 and 464 mt in 2010) is the Council's preliminary preferred OY alternative. This OY is based on the base model from the northern assessment, which assumes medium productivity (natural mortality (M) for males = 0.16 and M for females = 0.24). The OY is reduced by 3% to account for the portion of the assessed northern stock occurring in waters of Oregon north of Cape Falcon.

2.1.3.4 *California Scorpionfish*

All 2009-10 California scorpionfish (*Scorpaena guttata*) harvest specifications are based on the only assessment done for this stock in 2005 (Maunder, *et al.* 2006). This assessment indicated the California scorpionfish stock was healthy with an estimated spawning stock biomass of 79.8% of its initial, unfished biomass in 2005.

The California scorpionfish assessment used a recreational catch data stream based upon Commercial Passenger Fishing Vessel (CPFV) logbook data expanded to total recreational catch using a proportion of CPFV to total recreational catch (based upon MRFSS catch history). The SSC approved this assessment with the caveat that the ABC/OY from this assessment could only be related to recreational catch calculated in the same manner as this catch stream. CPFV logbook data, while valuable for stock assessment analyses, are not collected in as timely a manner as needed for inseason monitoring. Consequently, a method was derived with the assistance of the primary stock assessment author to modify the ABC/OY from the assessment so that it could be tracked using CRFS catch estimates. This method takes the recreational portion of the stock assessment ABC/OY, multiplies it by the CPFV proportion calculated from the MRFSS data (53 percent), and then divides it using the proportion of CPFV catch observed in the 2004 CRFS data (88 percent). The stock was pulled from the southern minor nearshore rockfish complex and managed with its own ABC/OY beginning in 2007. Two 2009-10 OY alternatives using projections from the 2005 assessment for California scorpionfish were considered for analysis.

OY Alternative 1 (111 mt in 2009 and 99 mt in 2010) is based on projecting the results of the 2005 assessment modified to incorporate CRFS monitoring data for the CPFV component as described above.

The preliminary preferred OY alternative for California scorpionfish is OY Alternative 2 (175 mt in 2009 and 155 mt in 2010). This OY alternative is the status quo OY and is based on a yield between 137 mt (2007-08 OY as modified by the CPFV modification described above) and 219 mt (2007-08 OY from the base model without the CPFV modification). The 2009 OY under this alternative also equals the projected ABC from the base model in the 2005 assessment. The 2010 OY is limited to the projected 2010 ABC from the base model in the 2005 assessment.

2.1.3.5 *Chilipepper Rockfish*

All 2009-2010 chilipepper rockfish (*Sebastes goodei*) OY alternatives are derived from a new assessment conducted in 2007 {Field 2008}. The 2007 assessment indicated the stock was healthy with a spawning stock biomass estimated to be at 70% of its initial, unfished biomass in 2006.

OY Alternative 1 (2,000 mt in 2009 and 2010) is the status quo 2007-08 OY and was specifically set lower than the estimated ABC, even though the stock was considered healthy, as a precautionary mechanism to be reduce the bycatch of co-occurring bocaccio.

OY Alternative 2 (2,099 mt in 2009 and 2010) is based on the estimated long term equilibrium MSY at an F50% SPR harvest rate from the 2007 assessment.

OY Alternative 3 (3,037 mt in 2009 and 2,576 mt in 2010) is based on the ABC/OY projections from the base model in the 2007 assessment.

The preliminary preferred OY Alternative (2,885 mt in 2009 and 2,447 mt in 2010) is based on the ABC/OY projections from the base model in the 2007 assessment with a 5% reduction to buffer the ABC and thereby reduce potential risk of overfishing.

2.1.3.6 *Dover Sole*

All 2009-10 Dover sole (*Microstomus pacificus*) harvest specifications are derived using projections from the most recent assessment conducted in 2005 (Sampson 2006). The 2005 assessment results indicated the coastwide Dover sole stock was healthy with an estimated spawning stock biomass at 63% of its initial, unfished biomass in 2005.

Only one OY alternative is considered for Dover sole; therefore, OY Alternative 1 (16,500 mt in 2009 and 2010) is the Council's preliminary preferred OY alternative. This OY is the status quo OY and is based on the estimated long term equilibrium MSY at an SPR harvest rate of F40% from the 2005 assessment.

2.1.3.7 *English Sole*

All 2009-10 English sole (*Parophrys vetulus*) harvest specifications are based on a new assessment in 2007 {Stewart 2008c}, which was an update of the last full assessment in 2005 (Stewart 2006). The updated assessment results indicated the stock is healthy with an estimated spawning stock biomass estimated to be at 116% of its initial, unfished biomass in 2007.

Only one OY alternative is considered for English sole; therefore, OY Alternative 1 (14,326 mt in 2009 and 9,745 mt in 2010) is the Council's preliminary preferred OY alternative. This OY is based on the ABC/OY projected from the base model in the 2007 updated assessment.

2.1.3.8 *Lingcod*

All 2009-10 lingcod (*Ophiodon elongatus*) OY alternatives are derived from projections in the most recent assessment done in 2005 (Jagielo and Wallace 2006). The 2005 assessment results indicated the stock was healthy with an estimated coastwide spawning stock biomass estimated to be at 60% of its initial, unfished biomass in 2005.

OY Alternative 1 (5,205 mt in 2009 and 4,785 mt in 2010) is based on sum of the projected ABC/OY from the 2005 assessment for the northern substock (north of 43° N latitude; Columbia and U.S.-Vancouver INPFC areas) and the status quo OY for the southern substock (south of 43° N latitude; Conception, Monterey, and Eureka INPFC areas). The coastwide OY is apportioned north and south of the Oregon-California border at 42° N latitude (4,593 mt in 2009 and 4,173 mt in 2010 for north of 42° N latitude; and 612 mt in 2009 and 2010 for south of 42° N latitude) to derive recreational harvest guidelines in California where relatively lower spawning stock abundance is still a concern (estimated spawning biomass for the southern substock was 24% of its initial, unfished biomass in 2005). The apportionment was done using status quo methodology as follows: the percentage of the 2005-06 OY estimated for the area between 42° and 43° N latitude was derived using the proportional lingcod landings in this area relative to landings further south (107 mt/719 mt) and applied this proportion to the estimated OY south of 43° N latitude to determine an estimated OY for the area between 42° and 43° N latitude. This was added to the projected OY for north of 43° N latitude to determine an appropriate OY for north of 42° N latitude.

The preliminary preferred OY is OY Alternative 2 (5,278 mt in 2009 and 4,829 mt in 2010). This OY alternative is based on the sum of the projected ABC/OY for the northern substock and the projected 40-10 adjusted OY for the southern substock. The 2009-10 coastwide OYs were apportioned north and south of the Oregon-California border using the same methodology described under OY Alternative 1 to derive northern and southern OY components (4,593 mt in 2009 and 4,173 mt in 2010 for north of 42° N latitude; and 685 mt in 2009 and 656 mt in 2010 for south of 42° N latitude).

2.1.3.9 *Longnose Skate*

All 2009-10 longnose skate (*Raja rhina*) OY alternatives are based on a new assessment conducted in 2007 {Gertseva and Schirripa 2008}. The 2007 assessment, which is the first one done for this species on the West Coast, indicated the stock is healthy with an estimated spawning stock biomass of 66% of its initial, unfished biomass in 2007. The Council will decide in June 2008 whether to use the 2007 assessment results to adjust the 2009-10 harvest specifications for the Other Fish complex, which longnose skate was one of the component species, or to establish separate species-specific specifications for longnose skate and adjust the Other Fish specifications accordingly.

OY Alternative 1 (901 mt in 2009 and 902 mt in 2010) is based on the projected OYs from the 2007 assessment using the current estimated exploitation rate.

The preliminary preferred OY alternative for longnose skate is OY Alternative 2 (1,349 mt in 2009 and 2010); although, as stated above, the Council has not decided whether to continue to manage longnose skate separately from the Other Fish complex. This OY alternative is based on a 50% increase in the average landings and discard mortality relative to the base model in the 2007 assessment.

OY Alternative 3 (3,428 mt in 2009 and 3,269 mt in 2010) is based on the ABC/OY projected from the 2007 assessment using the base model and the proxy SPR harvest rate of F45%.

2.1.3.10 *Longspine Thornyhead*

All 2009-10 longspine thornyhead (*Sebastolobus altivelis*) harvest specifications were derived from the most recent assessment done in 2005 (Fay 2006). The results of the 2005 coastwide assessment indicated the longspine thornyhead stock was healthy with an estimated spawning stock biomass at 71% of its initial, unfished biomass in 2005. The Council has managed longspine thornyhead with separate OYs north and south of Pt. Conception at 34°27' N latitude since 2007. The status quo 2007-08 specifications for longspine were an OY of 2,220 mt for north of Pt. Conception and an OY of 476 mt for south of Pt. Conception.

Only one OY alternative is considered for longspine thornyhead; therefore, OY Alternative 1 (north of Pt. Conception: 2,231 mt in 2009 and 2,175 mt in 2010; south of Pt. Conception: 395 mt in 2009 and 385 mt in 2010) is the Council's preliminary preferred OY alternative. This OY alternative is based on projected harvestable yields from the 2005 assessment using status quo methodology for apportioning the coastwide harvestable surplus north and south of Pt. Conception to specify area-specific OYs. The apportionment methodology assumed constant density throughout the Conception area and estimated 79% of the assessed coastwide biomass occurs north of Pt. Conception. The northern OY was then reduced by 25% to account for relatively high assessment uncertainty. The southern OY was reduced by 50% to account for relatively high assessment uncertainty and a paucity of survey data for the Conception area.

2.1.3.11 *Pacific Whiting*

Pacific whiting (*Merluccius productus*) are managed based on an annual assessment prepared jointly by U.S. and Canadian scientists. The most recent assessment, conducted in 2008 {Helser, *et al.* 2008}, estimated the stock's spawning biomass at 42.9% of its unfished spawning biomass at the beginning of

2008 and therefore healthy. Pacific whiting harvest specifications are based on these annual assessments and are only analyzed in this EIS to understand the potential bycatch implications of future whiting fisheries. The 2009 ABC and OY will presumably be considered and adopted by a new international Pacific whiting commission in accordance with the recently ratified Pacific Whiting treaty between the U.S. and Canada. The Council is still anticipated to set annual management measures for Pacific whiting fisheries. The analysis and discussion of the bycatch implications of future whiting fisheries in this EIS will serve to better understand effective management strategies to consider for future whiting fisheries (see section 2.2.3.2 for a description of whiting fishery management measure alternatives). These analyses will also aid the Council in deciding the yields of the most constraining species in whiting-directed fisheries to set-aside when deciding 2009-10 management measures for non-whiting fisheries, which collectively with 2009-10 whiting fisheries, must stay under the OY for these constraining species.

As placeholders, the Council specified a range of U.S. OY alternatives for analysis as follows: OY Alternative 1 (134,773 mt) is an OY half that specified in 2008, OY Alternative 2 (269,545 mt) is the status quo 2008 OY, and OY Alternative 3 (404,318 mt) is 150% of the status quo OY.

2.1.3.12 *Shortbelly Rockfish*

A new shortbelly rockfish (*Sebastes jordani*) was done as an academic exercise in 2007 to understand the potential environmental determinants of fluctuations in the recruitment and abundance of an unexploited rockfish population in the California Current ecosystem {Field, *et al.* 2008}. While the 2007 assessment did not go through the Council's STAR process, it was peer reviewed in a similar process and reviewed by the SSC in 2007 at the request of the SWFSC. The SSC noted the assessment did not fully satisfy the Council terms of reference for groundfish stock assessments. However, they concluded the assessment represents improved knowledge about shortbelly rockfish and might be suitable for management purposes in place of inferences from the hydroacoustic surveys conducted during 1977 and 1980, which formed the basis of the status quo ABC/OY of 13,900 mt. Based on this advice, the Council decided to use the assessment to consider alternative 2009-10 harvest specifications for shortbelly rockfish. The 2007 assessment results indicated the shortbelly stock was healthy with an estimated spawning stock biomass at 67% of its initial, unfished biomass in 2005.

OY Alternative 1 (3,475 mt in 2009 and 2010) is 25% of the status quo ABC/OY. The assessment author advised the Council that the stock would be expected to increase in abundance under this harvest rate.

The preliminary preferred OY alternative is OY Alternative 2 (6,950 mt in 2009 and 2010), which is 50% of the status quo ABC/OY. The assessment author advised the Council that the stock would be expected to remain in its current equilibrium under this harvest rate.

2.1.3.13 *Shortspine Thornyhead*

All 2009-10 shortspine thornyhead (*Sebastolobus alascanus*) harvest specifications were derived from the most recent assessment done in 2005 (Hamel 2006). The results of the 2005 coastwide assessment indicated the shortspine thornyhead stock was healthy with an estimated spawning stock biomass at 62.9% of its initial, unfished biomass in 2005. The Council has managed shortspine thornyhead with separate OYs north and south of Pt. Conception at 34°27' N latitude since 2007. The status quo 2007-08 specifications for shortspine were an OY of 1,634 mt for north of Pt. Conception and an OY of 421 mt for south of Pt. Conception.

Only one OY alternative is considered for shortspine thornyhead; therefore, OY Alternative 1 (north of Pt. Conception: 1,608 mt in 2009 and 1,591 mt in 2010; south of Pt. Conception: 414 mt in 2009 and 410 mt in 2010) is the Council's preliminary preferred OY alternative. This OY alternative is based on projected harvestable yields from the 2005 assessment using status quo methodology for apportioning the coastwide harvestable surplus north and south of Pt. Conception to specify area-specific OYs. The apportionment methodology assumed constant density throughout the Conception area and estimated 66% of the assessed coastwide biomass occurs north of Pt. Conception. The southern OY was reduced by 50% to account for relatively high assessment uncertainty due to a paucity of survey data for the Conception area.

2.1.3.14 *Splitnose Rockfish*

A 1994 splitnose rockfish (*Sebastes diploproa*) assessment (Rogers 1994) forms the basis for status quo and proposed 2009-10 harvest specifications for this stock. As in 2007-08, 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.

The Council chose the status quo harvest specifications of 615 mt and 461 mt as the preliminary preferred 2009-10 ABC and OY, respectively for chilipepper rockfish south of 40°10' N latitude.

2.1.3.15 *Starry Flounder*

All 2009-10 starry flounder (*Platichthys stellatus*) harvest specifications were derived from the most recent assessment done in 2005 (Ralston 2006). The results of the 2005 coastwide assessment indicated the starry flounder stock was healthy with an estimated spawning stock biomass at 44% and 62% of its initial, unfished biomass in Washington-Oregon and California, respectively in 2005. The Council started managing starry flounder with its own ABC/OY separate from the Other Flatfish complex since 2007. The status quo 2007-08 OY for starry flounder was 890 mt.

Only one OY alternative is considered for starry flounder; therefore, OY Alternative 1 (1,004 mt in 2009 and 1,077 mt in 2010) is the Council's preliminary preferred OY alternative. These OYs were projected from the base model in the 2005 assessment with a 25% precautionary reduction since this was considered a data-poor assessment.

2.1.3.16 *Yellowtail Rockfish*

All 2009-10 yellowtail rockfish (*Sebastes flavidus*) harvest specifications were derived from the most recent updated assessment done 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 results of the 2005 updated assessment indicated the yellowtail rockfish stock was healthy with an estimated spawning stock biomass at 55% of its initial, unfished biomass in 2005. The status quo 2007-08 ABC/OY for yellowtail rockfish was 4,548 mt.

Only one OY alternative is considered for yellowtail rockfish; therefore, OY Alternative 1 (4,562 mt in 2009 and 2010) is the Council's preliminary preferred OY alternative. This is the projected ABC/OY from the base model in the 2005 updated assessment.

2.1.4 Alternative Harvest Levels Analyzed for Unassessed Groundfish Species and Those Managed as Part of a Stock Complex

2.1.4.1 *Minor Rockfish South*

The minor rockfish south complex is comprised of three major assemblages of rockfish species: southern minor nearshore rockfish, southern minor shelf rockfish, and southern minor slope rockfish, all of which occur south of 40°10' N latitude. Harvest specifications for the minor rockfish south complex are the sum of those for the southern minor nearshore, shelf, and slope complexes. Alternative 2009-10 minor rockfish south specifications are affected by the new blue rockfish assessment, a component species in the status quo southern minor nearshore rockfish complex, and whether to continue to manage blue rockfish within the southern minor nearshore rockfish complex. The status quo 2007-08 ABC for the minor rockfish south complex is 3,403 mt, of which 232 mt is the blue rockfish contribution based on the average 1994-99 harvest south of 40°10' N latitude. The status quo 2007-08 OY for the minor rockfish south complex is 1,904 mt, of which 116 mt is the blue rockfish contribution based on 50% of the average 1994-99 harvest. The average 1994-99 harvest of blue rockfish in the southern California Bight south of Pt. Conception was 18 mt. The new blue rockfish assessment done in 2007 was for the portion of the stock in waters off California north of Pt. Conception.

OY Alternative 1 (1,970 mt in 2009 and 2010) contemplates continuing to manage blue rockfish stock within the southern minor nearshore rockfish complex. The ABC under this alternative is 3,384 mt in 2009 and 3,382 mt in 2010, which removes the old blue rockfish ABC contribution of 232 mt from the status quo ABC of 3,403 mt. Then the ABC contribution from the 2007 assessment (213 mt in 2009 and 211 mt in 2010) is added back in to derive the year-specific ABCs. The OY under this alternative is determined by first subtracting the status quo OY contribution of blue rockfish (116 mt) from the status quo OY of 1,904 mt. Then the OY contribution of blue rockfish from the new assessment (182 mt for the portion of the assessed stock south of 40°10' N latitude) is added back to derive the 1,970 mt OY. The blue rockfish OY contribution from the 2007 assessment is based on the OY projected using the base case, medium productivity model.

The preliminary preferred OY alternative for the minor rockfish south complex is OY Alternative 2 (1,990 mt in 2009 and 2010), which contemplates continuing to manage blue rockfish within the southern minor nearshore rockfish complex. The ABC and OY adjustments for the complex are the same as described under OY Alternative 1, except the new blue rockfish OY contribution is 202 mt and is based on the projected OY from the high productivity model in the 2007 assessment as capped by the base model ABC.

OY Alternative 3 (1,788 mt in 2009 and 2010) contemplates removing blue rockfish from the southern minor nearshore rockfish complex and managing blue rockfish under their own harvest specifications. The ABC under this alternative is 3,171 mt, which removes the old blue rockfish ABC contribution of 232 mt from the status quo ABC of 3,403 mt. The OY under this alternative is derived by removing the old blue rockfish OY contribution of 116 mt from the status quo OY of 1,904 mt.

2.1.4.2 *Southern Minor Nearshore Rockfish Species*

The southern minor nearshore rockfish complex 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*)]; and 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*)].

As described above, 2009-10 harvest specifications for the southern minor nearshore rockfish complex are affected by the 2007 blue rockfish and a decision whether to continue to manage blue rockfish within this complex as is status quo. Accordingly, there are three OY alternatives for the southern minor nearshore rockfish complex derived using the same methods as described for the minor rockfish south complex above.

OY Alternative 1 (630 mt in 2009 and 2010) contemplates continuing to manage blue rockfish stock within the complex. The OY under this alternative is determined by first subtracting the status quo OY contribution of blue rockfish (116 mt) from the status quo OY of 564 mt. Then the OY contribution of blue rockfish from the new assessment (182 mt for the portion of the assessed stock south of 40°10' N latitude) is added back to derive the 630 mt OY. The blue rockfish OY contribution from the 2007 assessment is based on the OY projected using the base case, medium productivity model.

The preliminary preferred OY alternative for the southern minor nearshore rockfish complex is OY Alternative 2 (650 mt in 2009 and 2010), which contemplates continuing to manage blue rockfish within the complex. The OY adjustment for the complex is the same as described under OY Alternative 1, except the new blue rockfish OY contribution is 202 mt and is based on the projected OY from the high productivity model in the 2007 assessment as capped by the base model ABC.

OY Alternative 3 (448 mt in 2009 and 2010) contemplates removing blue rockfish from the southern minor nearshore rockfish complex and managing blue rockfish under their own harvest specifications. The OY under this alternative is derived by removing the old blue rockfish OY contribution of 116 mt from the status quo OY of 564 mt.

2.1.4.3 *Southern Minor Shelf Rockfish Species*

The southern 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 OY of 714 mt as the only alternative to be analyzed for this complex during the 2009-10 management cycle (Tables 2-1a and 2-1b). This is therefore the OY for the complex under the preliminary preferred alternative.

2.1.4.4 *Southern Minor Slope Rockfish Species*

The southern 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 2009-10 OY alternative of 626 mt for this complex, which is therefore the OY for the southern minor slope rockfish complex under the preliminary preferred alternative.

2.1.4.5 *Minor Rockfish North*

The minor rockfish north complex is comprised of three major assemblages of rockfish species: northern minor nearshore rockfish, northern minor shelf rockfish, and northern minor slope rockfish, all of which occur north of 40°10' N latitude. Harvest specifications for the minor rockfish north complex are the sum of those for the northern minor nearshore, shelf, and slope complexes. Alternative 2009-10 minor rockfish north specifications are affected by the new blue rockfish assessment, a component species in the status quo northern minor nearshore rockfish complex, and whether to continue to manage blue rockfish within the northern minor nearshore rockfish complex. The status quo 2007-08 ABC for the minor rockfish north complex is 3,680 mt, of which 30 mt is the blue rockfish contribution based on the average 1994-99 harvest north of 40°10' N latitude. The status quo 2007-08 OY for the minor rockfish north complex is 2,270 mt, of which 15 mt is the blue rockfish contribution based on 50% of the average 1994-99 harvest. The new blue rockfish assessment done in 2007 was for the portion of the stock in waters off California north of Pt. Conception.

OY Alternative 1 (2,280 mt in 2009 and 2010) contemplates continuing to manage blue rockfish stock within the northern minor nearshore rockfish complex. The ABC under this alternative is 3,678 mt in 2009 and 2010, which removes the old blue rockfish ABC contribution of 30 mt from the status quo ABC of 3,680 mt. Then the ABC contribution from the 2007 assessment (28 mt in 2009 and 2010) is added back in to derive the 2009-10 ABC of 3,678 mt. The OY under this alternative is determined by first subtracting the status quo OY contribution of blue rockfish (15 mt) from the status quo OY of 2,270 mt. Then the OY contribution of blue rockfish from the new assessment (25 mt for the portion of the assessed stock north of 40°10' N latitude) is added back to derive the 2,280 mt OY. The blue rockfish OY contribution from the 2007 assessment is based on the OY projected using the base case, medium productivity model.

The preliminary preferred OY alternative for the minor rockfish north complex is OY Alternative 2 (2,283 mt in 2009 and 2010), which contemplates continuing to manage blue rockfish within the northern minor nearshore rockfish complex. The ABC and OY adjustments for the complex are the same as described under OY Alternative 1, except the new blue rockfish OY contribution is 28 mt and is based on the projected OY from the high productivity model in the 2007 assessment as capped by the base model ABC.

OY Alternative 3 (2,255 mt in 2009 and 2010) contemplates removing blue rockfish from the northern minor nearshore rockfish complex and managing blue rockfish under their own harvest specifications. The ABC under this alternative is 3,650 mt, which removes the old blue rockfish ABC contribution of 30 mt from the status quo ABC of 3,680 mt. The OY under this alternative is derived by removing the old blue rockfish OY contribution of 15 mt from the status quo OY of 2,270 mt.

2.1.4.6 *Northern Minor Nearshore Rockfish Species*

The northern 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*).

As described above, 2009-10 harvest specifications for the northern minor nearshore rockfish complex are affected by the 2007 blue rockfish and a decision whether to continue to manage blue rockfish within this complex as is status quo. Accordingly, there are three OY alternatives for the northern minor nearshore rockfish complex derived using the same methods as described for the minor rockfish north complex above.

OY Alternative 1 (152 mt in 2009 and 2010) contemplates continuing to manage blue rockfish stock within the complex. The OY under this alternative is determined by first subtracting the status quo OY contribution of blue rockfish (15 mt) from the status quo OY of 142 mt. Then the OY contribution of blue rockfish from the new assessment (25 mt for the portion of the assessed stock north of 40°10' N latitude) is added back to derive the 152 mt OY. The blue rockfish OY contribution from the 2007 assessment is based on the OY projected using the base case, medium productivity model.

The preliminary preferred OY alternative for the northern minor nearshore rockfish complex is OY Alternative 2 (155 mt in 2009 and 2010), which contemplates continuing to manage blue rockfish within the complex. The OY adjustment for the complex is the same as described under OY Alternative 1, except the new blue rockfish OY contribution is 28 mt and is based on the projected OY from the high productivity model in the 2007 assessment as capped by the base model ABC.

OY Alternative 3 (127 mt in 2009 and 2010) contemplates removing blue rockfish from the northern minor nearshore rockfish complex and managing blue rockfish under their own harvest specifications. The OY under this alternative is derived by removing the old blue rockfish OY contribution of 15 mt from the status quo OY of 142 mt.

2.1.4.7 *Northern Minor Shelf Rockfish Species*

The northern minor shelf rockfish complex north of 40°10' N latitude is comprised 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 alternative for the northern minor shelf rockfish complex, 968 mt, is recommended under the preliminary preferred alternative for 2009-10 (Tables 2-1a and 2-1b).

2.1.4.8 *Northern Minor Slope Rockfish Species*

The northern minor slope rockfish complex north of 40°10' N latitude is comprised 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 alternative for the Minor Slope Rockfish North complex, 1,160 mt, is recommended under the preliminary preferred alternative for 2009-10 (Tables 2-1a and 2-1b).

2.1.4.9 *Other Unassessed Species*

Pacific Cod

The West Coast population of Pacific cod (*Gadus macrocephalus*) has never been formally assessed. Therefore, as in 2007-08, the Pacific cod ABC of 3,200 mt is based on historic landings, with the 1,600 mt OY representing the Council's precautionary 50% adjustment for unassessed species (Tables 2-1a and 2-1b).

With no new information available regarding the status of Pacific cod, the Council recommends the status quo ABC and OY of 3,200 mt and 1,600 mt, respectively under the preliminary preferred alternative for 2009-10.

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*).

No change from status quo is identified by the Council for analysis; therefore, the status quo harvest specifications for the Other Flatfish complex (ABC = 6,731 mt and OY = 4,884 mt) are recommended under the preliminary preferred alternative for 2009-10 (Tables 2-1a and 2-1b).

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*), 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), kelp greenling (*Hexagrammos decagrammus*), and, prior to 2007, longnose skate (*Raja rhina*).

The 2009-10 harvest specifications for the Other Fish complex depend on the choice of a longnose skate OY and whether to continue to manage longnose skate within the complex given the new 2007 stock assessment (see section 2.1.3.9). The Council intends to make this decision at their June 2008 meeting. The Council did decide OY Alternative 2 for longnose skate as a preliminary preferred OY, which, if finalized in June 2008, would be used to adjust the 2009-10 harvest specifications for the complex. See section 4.3.4 for analysis and discussion of alternative Other Fish harvest specifications.

2.1.5 Alternative Harvest Levels Considered, But Eliminated From Detailed Study

This section to be completed after the June 2008 Council meeting.

2.2 Alternative Management Measures

2.2.1 *Yield Set-Asides*

Yield set-asides for constraining species need to be considered when considering new management measures. These set-asides are deducted from constraining species' OYs for the projected harvestable yields of these species, which limit fishing opportunities differentially by sector. Yield set-asides are considered "unchangeables" in the analysis of alternative management measures in this EIS and include projected 2009-10 research catches, total catches in tribal and non-groundfish fisheries, and yields reserved for possible 2009-10 exempted fishing permit (EFP) activities. Table 2-5 provides a summary of the yield set-asides for the depleted groundfish species projected by the GMT and used in initial EIS analyses.

Table 2-5. Summary of the 2009-10 yield set-asides of constraining depleted groundfish species projected by the GMT and used in initial EIS analyses.

Species	Yield Set-Asides (mt)					
	Tribal Catches		Inc. OA	Research	EFPs	Total
	Whiting	Non-Whiting				
Bocaccio	0.0	0.0	TBD a/	TBD a/	TBD b/	TBD a/
Canary	1.1	3.4	2.2	7.3	0.4	14.4
Cowcod	0.0	0.0	TBD a/	TBD a/	TBD b/	TBD a/
Darkblotched	TBD a/	TBD a/	TBD a/	TBD a/	TBD b/	TBD a/
POP	TBD a/	TBD a/	TBD a/	TBD a/	TBD b/	TBD a/
Widow	TBD a/	TBD a/	TBD a/	TBD a/	TBD b/	TBD a/
Yelloweye	0.0	2.3	0.6	3.0	0.1	6.0

a/ To be determined by the GMT at their June 2008 meeting.

b/ To be determined by the Council at their June 2008 meeting.

2.2.1.1 *Tribal Catches*

This section to be completed after the June 2008 Council meeting.

2.2.1.2 *Research Catches*

This section to be completed after the June 2008 Council meeting.

2.2.1.3 *Incidental Open Access Catches*

This section to be completed after the June 2008 Council meeting.

2.2.1.4 *Exempted Fishing Permit Catches*

The Council will decide yield set-asides to accommodate 2009-10 exempted fishing permit (EFP) activities at their June 2008 meeting.

This section to be completed after the June 2008 Council meeting.

2.2.2 Catch Sharing Agreements

The Council decided initial catch shares for analysis between sectors and states for canary and yelloweye rockfish. The Council also decided a catch sharing agreement between Oregon and California for black rockfish. All final catch sharing agreements for 2009-10 management will be decided at the June 2008 Council meeting.

2.2.2.1 *Canary Rockfish and Yelloweye Rockfish*

At their April 2008 meeting, the Council directed the GMT to use the initial 2005 and 2007 bycatch scorecards to apportion the available yields of canary and yelloweye rockfish between directed groundfish sectors and state recreational fisheries in their initial analyses of 2009-10 fishing impacts associated with alternative management measures (Table 2-6). These catch shares were determined as a percentage of the total directed harvest in 2005 and 2007.

Table 2-6. Catch shares of canary and yelloweye rockfish between groundfish sectors and state recreational fisheries based on the initial 2005 and 2007 bycatch scorecard percentages of the total directed harvest used by the GMT in their initial analyses of 2009-10 groundfish management measure alternatives.

Groundfish Sector	Catch Shares by Sector			
	Canary		Yelloweye	
	2005%	2007%	2005%	2007%
LE Non-Whiting Trawl	22.9%	24.1%	2.8%	0.7%
LE Whiting Trawl	20.9%	14.3%	2.8%	0.0%
LE Fixed Gear	2.6%	2.7%	17.5%	16.8%
Directed OA	2.9%	6.4%	4.2%	17.5%
WA Rec	5.7%	5.2%	24.5%	25.5%
OR Rec	18.6%	19.8%	22.4%	24.1%
CA Rec	26.6%	27.4%	25.9%	15.3%

The GMT deducted the yield set-asides for canary and yelloweye in Table 2-5 from the alternative canary and yelloweye OYs in Tables 2-1a and 2-1b and then applied the catch shares in Table 2-6 to determine the alternative yield amounts of these constraining species available to groundfish sectors in 2009-10. Tables 2-7 and 2-8 depict the 2009-10 projected available yields by groundfish sector and OY alternative of canary and yelloweye rockfish, respectively. These yield amounts served as sector limits in analyzing sector impacts associated with alternative management measures.

Table 2-7. Yield amounts (mt) of canary rockfish available to groundfish sectors in 2009-10 after deducting projected set-asides by OY alternative.

Groundfish Sector	Catch Sharing Basis	OY Alt. 2 35 mt	OY Alt. 3 44 mt	OY Alt. 4 85 mt	OY Alt. 5 105 mt	OY Alt. 6 155 mt
LE Non-Whiting Trawl	2005%	4.7	6.8	16.1	20.7	32.1
	2007%	5.0	7.1	17.0	21.8	33.9
LE Whiting Trawl	2005%	4.3	6.2	14.7	18.9	29.3
	2007%	3.0	4.2	10.1	13.0	20.1
LE Fixed Gear	2005%	0.5	0.8	1.8	2.3	3.6
	2007%	0.6	0.8	1.9	2.5	3.9
Directed OA	2005%	0.6	0.8	2.0	2.6	4.0
	2007%	1.3	1.9	4.5	5.8	9.0
WA Rec	2005%	1.2	1.7	4.0	5.2	8.0
	2007%	1.1	1.5	3.7	4.7	7.3
OR Rec	2005%	3.8	5.5	13.1	16.8	26.1
	2007%	4.1	5.9	14.0	18.0	27.9
CA Rec	2005%	5.5	7.9	18.8	24.1	37.4
	2007%	5.7	8.1	19.4	24.9	38.6

Table 2-8. Yield amounts (mt) of yelloweye rockfish available to groundfish sectors in 2009-10 after deducting projected set-asides by OY alternative.

Groundfish Sector	Catch Sharing Basis	OY Alt. 2		OY Alt. 3		OY Alt. 4		OY Alt. 5	
		2009	2010	2009	2010	2009	2010	2009	2010
		13 mt	14 mt	17 mt	14 mt	15 mt	15 mt	17 mt	17 mt
LE Non-Whiting Trawl	2005%	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3
	2007%	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LE Whiting Trawl	2005%	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3
	2007%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LE Fixed Gear	2005%	1.2	1.4	1.9	1.4	1.6	1.6	1.9	1.9
	2007%	1.2	1.3	1.8	1.3	1.5	1.5	1.8	1.8
Directed OA	2005%	0.3	0.3	0.5	0.3	0.4	0.4	0.5	0.5
	2007%	1.2	1.4	1.9	1.4	1.6	1.6	1.9	1.9
WA Rec	2005%	1.7	2.0	2.7	2.0	2.2	2.2	2.7	2.7
	2007%	1.8	2.0	2.8	2.0	2.3	2.3	2.8	2.8
OR Rec	2005%	1.6	1.8	2.5	1.8	2.0	2.0	2.5	2.5
	2007%	1.7	1.9	2.6	1.9	2.2	2.2	2.6	2.6
CA Rec	2005%	1.8	2.1	2.8	2.1	2.3	2.3	2.8	2.8
	2007%	1.1	1.2	1.7	1.2	1.4	1.4	1.7	1.7

2.2.2.2 *Black Rockfish*

Under the Council's preliminary preferred alternative, the black rockfish catch sharing framework for 2009-10 carries forward the status quo proportions of 58% of the southern OY to Oregon and 42% to California. Those values would be recorded as harvest guidelines in the Federal regulations for the respective states upon approval of the EIS. These percentages result in an Oregon harvest guideline of 580 mt and a California harvest guideline of 420 mt under the preliminary preferred OY alternative for the southern black rockfish stock. Washington fisheries will manage to the preliminary preferred northern black rockfish OY of 490 mt in 2009 and 464 mt in 2010.

2.2.3 New Management Lines

2.2.3.1 *Addition of a 25 fm Management Line in Washington Marine Area 2*

The Washington Department of Fish and Wildlife proposes a new 25 fm management line in Washington Marine Area 2 (South Coast), as defined by the following waypoints:

47°31.70 N lat.; 124°34.660 W long.
47°25.67 N lat.; 124°32.775 W long.
47°12.82 N lat.; 124°26.000 W long.
46°52.94 N lat.; 124°18.940 W long.
46°44.18 N lat.; 124°14.890 W long.
46°38.17 N lat.; 124°13.700 W long.

The WDFW proposes to use this line to potentially restrict Marine Area 2 recreational groundfish fisheries to shallower waters during March 15-June 15 in 2009 or 2010 as an inseason adjustment if needed to reduce impacts on canary or yelloweye rockfish.

2.2.3.2 *Proposed Changes to Rockfish Conservation Area Management Lines Off California*

Adjustments to RCA latitude and longitude lines in waters off California are being proposed by industry representatives and CDFG. Table 2-9 indicates the general areas in waters off California of these proposed RCA management line changes. Industry requests were made to better approximate depth contours, allowing access to valuable fishing grounds that otherwise would not be available (Tables 2-10 to 2-12). CDFG requests include error corrections as well as changes to management lines to better approximate actual depth contours (Tables 2-14 to 2-16). All proposed changes were reviewed by CDFG Enforcement personnel, who verified that they do not conflict with Essential Fish Habitat areas or Marine Protected Areas. Adjustments are necessary because substantial discrepancies exist between current and proposed depth contours, resulting in lost fishing grounds, lost revenue, and differences in actual versus predicted bycatch.

Proposed adjustments to the non-trawl RCAs are not expected to increase overfished species bycatch. Changes to the 50 fm line near Point Conception and the 60 fm line off Morro Bay will not increase overfished species bycatch because those areas reside within the RCA boundary where fishing is prohibited. Changes to the 60 fm line around the Channel Islands, Catalina Island, Santa Monica Bay, and San Diego are also not expected to have increased bycatch of overfished species because there is a minimal occurrence of overfished species in those areas. The 150 fm line changes off San Francisco and Half Moon Bay (Pioneer Canyon) are not expected to have any increased overfished species bycatch because few overfished species occur at that depth.

Proposed adjustments to the trawl RCAs are not expected to increase overfished species bycatch. Both changes occur at depths greater than where these species occur.

Table 2-9. The general areas in waters off California of industry and CDFG-requested Rockfish Conservation Area management line changes.

Depth (fm)	RCA	Area
50	Non-trawl	Point Conception
60	Non-trawl	Morro Bay
60	Non-trawl	Northern Channel Islands, west end
60	Non-trawl	Santa Cruz Island, Sandstone Point
60	Non-trawl	Santa Rosa Island, east point
60	Non-trawl	San Clemente Island, west end
60	Non-trawl	Catalina Island, west end
60	Non-trawl	Santa Monica Bay
60	Non-trawl	Palos Verdes
60	Non-trawl	San Diego
150	Non-trawl	San Francisco
150	Non-trawl	Half Moon Bay, Pioneer Canyon
150	Trawl	Westport
250	Trawl	Tolo Banks

Table 2-10. Coordinates for the industry-proposed changes to the 60 fm management line in waters off California.

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
	33	48.48	N	118	26.86	**add**	shoreward	W				
170	33	47.75	N	118	30.21	**revision**	seaward	W	33	47.54	118	29.65
186	32	59.87	N	117	19.16	**revision**	seaward	W	33	0.08	117	19.02
	32	57.39	N	117	18.72	**add**	seaward	W				
187	32	55.87	N	117	19.17	**revision**	seaward	W	32	56.11	117	18.41
	32	55.31	N	117	18.8	**add**	seaward	W				
188	32	54.38	N	117	17.09	**revision**	seaward	W	32	54.43	117	16.93
189	32	52.81	N	117	16.94	**revision**	seaward	W	32	51.89	117	16.42
190	32	52.56	N	117	19.3	**revision**	seaward	W	32	52.61	117	19.5
	32	50.86	N	117	20.98	**add**	seaward	W				
	32	45.58	N	117	22.38	**add**	seaward	W				
193	32	43.6	N	117	20.72	**revision**	seaward	W	32	43.52	117	19.32
	32	41.52	N	117	20.12	**add**	seaward	W				
	32	37	N	117	20.1	**add**	seaward	W				
	32	34.76	N	117	18.77	**add**	seaward	W				
194	32	33.7	N	117	18.46	**revision**	seaward	W	32	33.56	117	17.72
	33	57.81	N	119	33.72	**add**	seaward	W				
	33	57.65	N	119	35.94	**add**	seaward	W				
20	33	49.29	N	119	55.76	**revision**	seaward	W	33	50.28	119	56.02

Table 2-10. Coordinates for the industry-proposed changes to the 60 fm management line in waters off California (continued).

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
21	33	48.11	N	119	59.72	**revision**	seaward	W	33	48.51	119	59.67
23	33	52.95	N	120	10	**revision**	seaward	W	33	51.93	120	6.5
24	33	54.36	N	120	13.06	**delete**		W	33	54.36	120	13.06
25	33	56	N	120	17	**revision**	seaward	W	33	58.53	120	20.46
1	33	28.15	N	118	38.17	**revision**	seaward	W	33	28.15	118	37.85
14	33	24.99	N	118	32.25	**revision**	seaward	W	33	25.13	118	32.16
16	33	28.15	N	118	38.17	**revision**	seaward	W	33	28.15	118	37.85
1	33	4.44	N	118	37.61	**revision**	seaward	W	33	4.06	118	37.32
13	33	3.49	N	118	38.81	**revision**	seaward	W	33	3.31	118	38.74
14	33	4.44	N	118	37.61	**revision**	seaward	W	33	4.06	118	37.32

Table 2-11. Coordinates for the industry-proposed changes to the 150 fm management line in waters off California.

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
	39	39.82		123	59.98	**add**	shoreward					
187	39	34.59	N	123	58.08	**revision**	shoreward	W	39	34.75	123	58.5
	37	26.1	N	122	57.07	**add**	shoreward	W				
	37	26.51	N	122	54.23	**add**	shoreward	W				
	37	25.05	N	122	55.64	**add**	shoreward	W				
	37	24.42	N	122	54.94	**add**	shoreward	W				
	37	25.16	N	122	52.73	**add**	shoreward	W				
	37	24.55	N	122	52.48	**add**	shoreward	W				
	37	22.81	N	122	54.36	**add**	shoreward	W				
	37	19.87	N	122	53.98	**add**	shoreward	W				
	39	56.44	N	124	12.52	**add**	shoreward	W				
	39	54.98	N	124	8.71	**add**	shoreward	W				

Table 2-12. Coordinates for the industry-proposed changes to the 250 fm management line in waters off California.

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
119	39	52.6	N	124	10.01	**revision**	shoreward	W	39	51.85	124	10.33
120	39	37.37	N	124	0.58	**revision**	shoreward	W	39	36.9	124	0.63

Table 2-13. Coordinates for the CDFG-proposed changes to the 50 fm management line in waters off California.

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
120	36	10.41	N	121	42.88	**crossover**	seaward	W	36	10.41	121	42.92
126	35	27.74	N	121	4.69	**revision**	shoreward	W	35	24.35	121	2.53
128	34	37.98	N	120	46.48	**revision**	shoreward	W	34	39.52	120	48.72
129	34	32.98	N	120	43.34	**revision**	shoreward	W	34	31.26	120	44.12
170	33	35.53	N	118	6.66	**revision**	seaward	W	33	35.85	118	7
171	33	35.93	N	118	4.78	**revision**	seaward	W	33	36.12	118	4.15
173	33	33.84	N	117	59.77	**revision**	seaward	W	33	34	117	59.53
174	33	35.33	N	117	55.89	**revision**	seaward	W	33	35.44	117	55.67
175	33	35.05	N	117	53.72	**revision**	seaward	W	33	35.15	117	53.55
176	33	31.32	N	117	48.01	**revision**	seaward	W	33	31.12	117	47.4
178	33	26.93	N	117	44.24	**revision**	seaward	W	33	26.93	117	43.98
179	33	25.46	N	117	42.06	**revision**	seaward	W	33	25.44	117	41.63
180	33	18.45	N	117	35.73	**revision**	seaward	W	33	19.5	117	36.08
181	33	12.74	N	117	28.53	**delete**		W	33	12.74	117	28.53
183	33	7.47	N	117	21.62	**revision**	seaward	W	33	7.5	117	21.52
	33	4.47	N	117	21.24	**add**	seaward	W				
184	32	59.89	N	117	19.11	**revision**	seaward	W	32	59.77	117	18.83
	32	57.41	N	117	18.64	**add**	seaward	W				
185	32	55.71	N	117	18.99	**revision**	seaward	W	32	56.1	117	18.37
187	32	52.34	N	117	16.73	**revision**	seaward	W	32	51.89	117	16.42
	32	52.64	N	117	17.76	**add**	seaward	W				
190	32	45.09	N	117	20.68	**delete**		W	32	45.09	117	20.68
191	32	41.93	N	117	19.68	**revision**	seaward	W	32	43.62	117	18.68
192	32	33.59	N	117	17.89	**revision**	seaward	W	32	33.43	117	17

Table 2-14. Coordinates for the CDFG-proposed changes to the 60 fm management line in waters off California.

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
137	36	0	N	121	35.34	**revision**	seaward	W	36	0	121	35.15
140	35	26.31	N	121	3.73	**revision**	shoreward	W	35	24.35	121	2.53
147	34	23.02	N	119	56.36	**revision**	seaward	W	34	23.18	119	56.17
151	34	3.88	N	119	12.72	**revision**	seaward	W	34	3.88	119	12.46
154	34	1.34	N	119	0.43	**revision**	seaward	W	34	1.28	119	0.27
155	34	0.27	N	119	3.25	**revision**	seaward	W	34	0.2	119	3.18
156	33	59.6	N	119	3.28	**revision**	seaward	W	33	59.6	119	3.14
160	33	58.86	N	118	36.24	**revision**	seaward	W	33	59.06	118	36.3
162	33	53.63	N	118	37.88	**revision**	seaward	W	33	53.56	118	37.73
169	33	50.06	N	118	24.79	**revision**	seaward	W	33	49.87	118	24.37
175	33	35.8	N	118	16.65	**revision**	seaward	W	33	35.98	118	16.54
176	33	33.92	N	118	11.36	**revision**	seaward	W	33	34.15	118	11.22
180	33	35.25	N	117	55.89	**revision**	seaward	W	33	35.44	117	55.65
181	33	35.03	N	117	53.8	**revision**	seaward	W	33	35.15	117	53.54
182	33	31.37	N	117	48.15	**revision**	seaward	W	33	31.12	117	47.39
184	33	16.63	N	117	34.01	**revision**	seaward	W	33	16.42	117	32.92
185	33	7.21	N	117	21.96	**revision**	seaward	W	33	6.66	117	21.59
	33	3.35	N	117	21.22	**add**	seaward	W				
	33	2.14	N	117	20.26	**add**	seaward	W				
1	34	9.83	N	120	25.61	**revision**	seaward	W	34	9.16	120	26.31
2	34	7.03	N	120	10.55	**revision**	seaward	W	34	6.69	120	16.43
4	34	7.9	N	119	55.12	**revision**	seaward	W	34	7.36	119	52.06
5	34	5.07	N	119	37.33	**revision**	seaward	W	34	4.84	119	36.94
6	34	4.84	N	119	35.5	**delete**		W	34	4.84	119	35.5
9	34	2.8	N	119	21.4	**delete**		W	34	2.8	119	21.4
10	34	2.27	N	119	18.73	**revision**	seaward	W	34	2.36	119	18.97
11	34	0.98	N	119	19.1	**revision**	seaward	W	34	0.65	119	19.42
12	33	59.44	N	119	21.89	**revision**	seaward	W	33	59.45	119	22.38
13	33	58.7	N	119	32.22	**revision**	seaward	W	33	58.68	119	32.36
17	33	59.32	N	119	55.65	**revision**	seaward	W	33	59.32	119	55.59
18	33	57.73	N	119	55.06	**revision**	seaward	W	33	57.52	119	55.19
19	33	56.48	N	119	53.8	**revision**	seaward	W	33	56.1	119	54.25
27	34	8.23	N	120	36.25	**revision**	seaward	W	34	8.09	120	35.85
29	34	9.83	N	120	25.61	**revision**	seaward	W	34	9.16	120	26.31
	33	26.3	N	118	25.38	**add**	seaward	W				
9	33	16.65	N	118	17.71	**revision**	seaward	W	33	16.72	118	18.07
11	33	20.07	N	118	32.34	**revision**	seaward	W	33	20.03	118	32.04
12	33	21.82	N	118	32.08	**revision**	seaward	W	33	21.86	118	31.72

Table 2-15. Coordinates for the CDFG-proposed changes to the 75 fm management line in waters off California.

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
	37	28.2	N	122	54.92	**add**	shoreward	W				
	37	27.34	N	122	52.91	**add**	shoreward	W				
	37	26.45	N	122	52.95	**add**	shoreward	W				
144	37	26.06	N	122	51.17	**revision**	shoreward	W	37	24.16	122	51.96
145	37	23.07	N	122	51.34	**revision**	shoreward	W	37	23.32	122	52.38
183	36	0	N	121	35.4	**revision**	seaward	W	36	0	121	35.15
186	35	25.09	N	121	3.02	**revision**	shoreward	W	35	24.33	121	2.53
200	34	3.86	N	119	12.78	**revision**	seaward	W	34	3.89	119	12.47
202	34	4.47	N	119	5.01	**revision**	seaward	W	34	4.53	119	4.9
203	34	2.84	N	119	2.37	**delete**		W	34	2.84	119	2.37
204	34	1.31	N	119	0.7	**revision**	seaward	W	34	1.3	119	0.26
205	34	0.32	N	119	3.31	**revision**	seaward	W	34	0.22	119	3.2
206	33	59.56	N	119	3.36	**revision**	seaward	W	33	59.6	119	3.16
207	33	59.35	N	119	0.92	**revision**	seaward	W	33	59.46	119	0.88
213	33	51.19	N	118	36.5	**revision**	seaward	W	33	51.22	118	36.17
216	33	49.77	N	118	26.34	**revision**	seaward	W	33	49.95	118	26.38
218	33	49.92	N	118	25.05	**revision**	seaward	W	33	49.84	118	24.78
	33	48.7	N	118	26.7	**add**	shoreward	W				
219	33	47.72	N	118	30.48	**revision**	seaward	W	33	47.53	118	30.12
221	33	41.62	N	118	20.31	**revision**	seaward	W	33	41.77	118	20.32
222	33	38.15	N	118	15.85	**revision**	seaward	W	33	38.17	118	15.7
223	33	37.53	N	118	16.82	**revision**	seaward	W	33	37.48	118	16.73
224	33	35.76	N	118	16.75	**revision**	seaward	W	33	36.01	118	16.55
228	33	33.67	N	117	59.98	**revision**	seaward	W	33	33.75	117	59.82
229	33	34.98	N	117	55.66	**revision**	seaward	W	33	35.1	117	55.68
230	33	34.84	N	117	53.83	**revision**	seaward	W	33	34.91	117	53.76
231	33	31.43	N	117	48.76	**revision**	seaward	W	33	30.77	117	47.56
232	33	27.5	N	117	44.87	**delete**		W	33	27.5	117	44.87
233	33	16.61	N	117	34.49	**revision**	seaward	W	33	16.89	117	34.37
234	33	7.43	N	117	22.4	**revision**	seaward	W	33	6.66	117	21.59
235	33	2.93	N	117	21.12	**revision**	seaward	W	33	3.35	117	20.92
	33	2.09	N	117	20.28	**add**	seaward	W				
236	32	59.91	N	117	19.28	**revision**	seaward	W	33	0.07	117	19.02
	32	57.27	N	117	18.82	**add**	seaward	W				
237	32	56.17	N	117	19.43	**revision**	seaward	W	32	55.99	117	18.6
	32	55.22	N	117	19.09	**add**	seaward	W				
238	32	54.3	N	117	17.13	**revision**	seaward	W	32	54.43	117	16.93
239	32	52.89	N	117	17.03	**revision**	seaward	W	32	52.13	117	16.55
	32	50.85	N	117	21.14	**add**	seaward	W				
241	32	47.11	N	117	22.95	**revision**	seaward	W	32	46.95	117	22.81

Table 2-15. Coordinates for the CDFG-proposed changes to the 75 fm management line in waters off California (continued).

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
242	32	45.66	N	117	22.6	**revision**	seaward	W	32	45.01	117	22.07
243	32	42.99	N	117	20.7	**revision**	seaward	W	32	43.4	117	19.8
	32	40.72	N	117	20.23	**add**	seaward	W				
	32	38.11	N	117	20.59	**add**	seaward	W				
244	32	33.83	N	117	19.18	**revision**	seaward	W	32	33.74	117	18.67
1	34	10.82	N	120	33.26	**revision**	seaward	W	34	9.12	120	35.03
2	34	11.78	N	120	28.12	**revision**	seaward	W	34	9.99	120	27.85
3	34	8.65	N	120	18.46	**revision**	seaward	W	34	7.19	120	16.28
	34	7.01	N	120	10.46	**add**	seaward	W				
5	34	8.11	N	119	55.01	**revision**	seaward	W	34	7.27	119	57.76
6	34	7.48	N	119	52.08	**delete**		W	34	7.48	119	52.08
11	34	3	N	119	21.36	**delete**		W	34	3	119	21.36
13	34	0.95	N	119	18.95	**revision**	seaward	W	34	0.65	119	19.42
14	33	59.4	N	119	21.74	**revision**	seaward	W	33	59.45	119	22.38
15	33	58.7	N	119	32.21	**revision**	seaward	W	33	58.68	119	32.36
	33	57.67	N	119	33.72	**add**	seaward	W				
	33	57.54	N	119	36.32	**add**	seaward	W				
18	33	56.91	N	119	52.04	**revision**	seaward	W	33	57.78	119	53.04
20	33	57.82	N	119	54.99	**revision**	seaward	W	33	57.57	119	54.93
21	33	56.58	N	119	53.75	**revision**	seaward	W	33	56.35	119	53.91
28	33	52	N	120	8.15	**revision**	seaward	W	33	51.41	120	6.49
29	33	52.99	N	120	10.01	**delete**		W	33	52.99	120	10.01
30	33	56.64	N	120	18.88	**delete**		W	33	56.64	120	18.88
31	33	58.02	N	120	21.41	**delete**		W	33	58.02	120	21.41
32	33	58.11	N	120	25.59	**revision**	seaward	W	33	58.73	120	25.22
33	33	59.08	N	120	26.58	**delete**		W	33	59.08	120	26.58
34	33	59.95	N	120	28.21	**delete**		W	33	59.95	120	28.21
35	34	2.15	N	120	32.7	**revision**	seaward	W	34	3.54	120	32.23
36	34	5.57	N	120	34.23	**delete**		W	34	5.57	120	34.23
37	34	8.86	N	120	37.12	**revision**	seaward	W	34	8.13	120	36.05
38	34	10.82	N	120	33.26	**revision**	seaward	W	34	9.12	120	35.03
5	33	26.33	N	118	25.37	**revision**	seaward	W	33	26.31	118	25.14
12	33	20.07	N	118	32.35	**revision**	seaward	W	33	20.07	118	32.12
13	33	21.82	N	118	32.09	**revision**	seaward	W	33	21.77	118	31.85
17	33	27.57	N	118	37.9	**revision**	seaward	W	33	27.8	118	37.9

Table 2-16. Coordinates for the CDFG-proposed changes to the 100 fm management line in waters off California.

Point	lat_deg	lat_min	lat_dir	long_deg	long_min	action	long change	long_dir	lat_deg	lat_min	long_deg	long_min
	37	26.81	N	122	55.57	**add**	shoreward	W				
	37	27.29	N	122	53.14	**add**	shoreward	W				
	37	25.74	N	122	54.13	**add**	shoreward	W				
	37	25.33	N	122	53.59	**add**	shoreward	W				
	37	25.94	N	122	51.8	**add**	shoreward	W				
	37	24.49	N	122	51.76	**add**	shoreward	W				
	37	23.25	N	122	53.12	**add**	shoreward	W				
251	36	0	N	121	35.41	**revision**	seaward	W	36	0	121	35.15
252	35	57.84	N	121	32.81	**revision**	shoreward	W	35	57.84	121	33.1
294	32	53.36	N	117	19.97	**revision**	seaward	W	32	53.34	117	19.13

2.2.4 Description of the Management Measure Alternatives

The No Action Alternative is described by the 2007 and 2008 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 2008 in reaction to problems that arose in managing the 2007 fishery. While 2007 management measures, including inseason adjustments, will be described in detail, the 2008 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 2-17.

[Note: Socioeconomic analyses associated with management measure alternatives will be provided in one or more supplemental attachments to the June 2008 briefing book]

2.2.4.1 *The No Action Alternative*

The projected impacts on depleted species for 2007 and 2008 by fishing sector are provided in Tables 4-07Catch and 2-17, respectively. A description of the management measures by fishing sector under the No Action Alternative follows.

Table 2-17. Projected impacts of depleted groundfish species by West Coast fishing sector in 2008.

[Insert 2008 scorecard here]

Limited Entry Non-Whiting Trawl

The 2008 trawl trip limits and seasonal RCA configurations (as of May 2008) describe the No Action Alternative and are shown in Tables 2-18 (north of 40°10' N latitude) and 2-19 (south of 40°10' N latitude).

Selective flatfish trawls have been mandated for the limited entry trawl fishery operating shoreward of the trawl RCA north of 40°10' N latitude since 2005. 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.

Minimizing the trawl bycatch of canary rockfish north of 40°10' N latitude has driven much of the management decision-making in 2007-08. The area north of Cape Alava at 48°10' N latitude shoreward of the trawl RCA was closed to the shoreline for much of 2007 and through 2008 (as of May 2008) because new WCGOP data indicated a higher than expected canary bycatch rate (Table 2-18). Likewise, the area shoreward of the trawl RCA between Cape Arago, Oregon at 43°20.83' N latitude and Humbug Mountain, Oregon at 42°40.50' N latitude was closed to the shoreline in 2008 for the same reason. Trip limits for Dover sole, thornyheads, and sablefish (DTS species), which are found in deep water seaward of the trawl RCA, were increased as an incentive for more trawl fishermen to fish deeper in the north to avoid canary.

Scottish seine gear is exempted from trawl RCA closures in the area between 38° N latitude and 36° N latitude, where low bycatch rates of overfished species were previously demonstrated through an EFP. The exemption is also limited to depths less than 100 fm. This encompasses the primary flatfish target areas but reduces risk associated with the exemption. VMS must be used and the operator is required to adhere to declaration requirements to provide for enforcement of this exemption. The gear remained within the WCGOP pool, enabling monitoring of bycatch rates.

One yelloweye RCA off the Washington coast, South Coast Area B (Figure 2-4) was a voluntary "area to be avoided" for commercial groundfish fisheries.

Though 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 2-5).

Coordinates defining these YRCAs are provided in Federal regulations at 50 CFR 660.390.

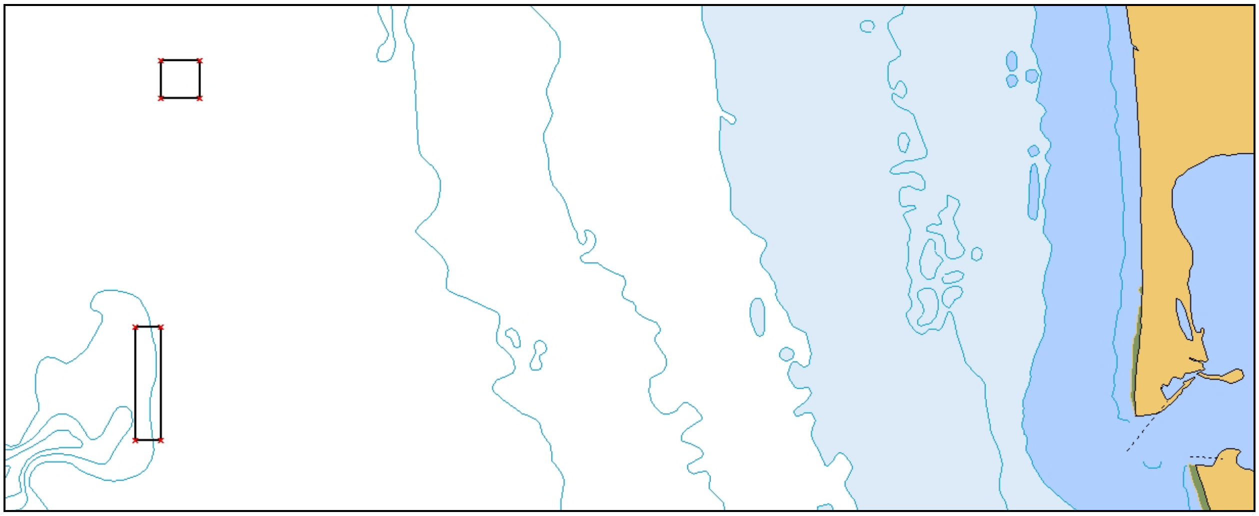

Figure 2-4. Two proposed Yelloweye Rockfish Conservation Areas (WA South Coast A and B) in waters off the Washington south coast where all fishing would be prohibited in 2007-08. Only WA South Coast B, the southernmost YRCA in the figure, was adopted in Federal regulations for 2007-08 as a mandatory closed area for recreational groundfish and Pacific halibut fisheries and a voluntary area to be avoided in 2007-08 commercial fisheries.

Table 2-18. The status quo limited entry trawl trip limits and RCA restrictions north of 40°10' N latitude as of May 2008.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
1	North of 48°10.00' N. lat.	shore - modified 200 fm [7/]	shore - 200 fm	shore - 150 fm			shore - modified 200 fm [7/]
2	48°10.00' N. lat. - 46°38.17' N. lat.	75 fm - modified 200 fm [7/]	60 fm - 200 fm	60 fm - 150 fm			75 fm - modified 200 fm [7/]
3	46°38.17' N. lat. - 46°16.00 N. lat.		60 fm - 200 fm		60 fm - 150 fm		
4	46°16.00 N. lat. - 45°46.00' N. lat.		75 fm - 200 fm	75 fm - 150 fm		75 fm - 200 fm	
5	45°46.00' N. lat. - 43°20.83' N. lat.		75 fm - 200 fm				
6	43°20.83' N. lat. - 42°40.50' N. lat.	shore - modified 200 fm [7/]	shore - 200fm				shore - modified 200 fm [7/]
7	42°40.50' N. lat. -40°10.00' N. lat.	75 fm - modified 200 fm [7/]	75 fm - 200 fm	60 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. Large footrope trawl gear is prohibited shoreward 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 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).

State trip limits and seasons 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
8	**Minor slope rockfish[2/] & Darkblotched rockfish**	1,500 lb/ 2 months					
9	**Pacific ocean perch**	1,500 lb/ 2 months					
10	**DTS complex**						
11	Sablefish						
12	large & small footrope gear	14,000 lb/ 2 months		19,000 lb/ 2 months			14,000 lb/ 2 months
13	selective flatfish trawl gear	5,000 lb/ 2 months					
14	multiple bottom trawl gear [8/]	5,000 lb/ 2 months					
15	Longspine thornyhead						
16	large & small footrope gear	25,000 lb/ 2 months					
17	selective flatfish trawl gear	3,000 lb/ 2 months					
18	multiple bottom trawl gear [8/]	3,000 lb/ 2 months					
19	Shortspine thornyhead						
20	large & small footrope gear	12,000 lb/ 2 months		25,000 lb/ 2 months			
21	selective flatfish trawl gear	3,000 lb/ 2 months					
22	multiple bottom trawl gear [8/]	3,000 lb/ 2 months					
23	Dover sole						
24	large & small footrope gear	80,000 lb/ 2 months					
25	selective flatfish trawl gear	40,000 lb/ 2 months	50,000 lb/ 2 months	40,000 lb/ 2 months			
26	multiple bottom trawl gear [8/]	40,000 lb/ 2 months	50,000 lb/ 2 months	40,000 lb/ 2 months			

Table 2-18. The status quo limited entry trawl trip limits and RCA restrictions north of 40°10' N latitude as of May 2008 (continued).

27	**Whiting**				
28	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.			
29	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.			
30	**Flatfish** (except Dover sole)				
31	Arrowtooth flounder				
32	large & small footrope gear	150,000 lb/ 2 months			
33	selective flatfish trawl gear	10,000 lb/ 2 months			
34	multiple bottom trawl gear [8/]	10,000 lb/ 2 months			
35	Other flatfish [3/], English sole, starry flounder, & Petrale sole				
36	large & small footrope gear for Other flatfish[3/], English sole, & starry flounder	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, no more than 20,000 lb/ 2 months of which may be petrale sole.	110,000 lb/ 2 months
37	large & small footrope gear for Petrale sole	40,000 lb/ 2 months			40,000 lb/ 2 months
38	selective flatfish trawl gear for Other flatfish[3/], English sole, & starry flounder	70,000 lb/ 2 months, no more than 10,000 lb/ 2 months of which may be petrale sole.	70,000 lb/ 2 months, no more than 18,000 lb/ 2 months of which may be petrale sole.	50,000 lb/ 2 months, no more than 18,000 lb/ 2 months of which may be petrale sole.	50,000 lb/ 2 months, no more than 10,000 lb/ 2 months of which may be petrale sole.
39	selective flatfish trawl gear for Petrale sole				
40	multiple bottom trawl gear [8/]	70,000 lb/ 2 months, no more than 10,000 lb/ 2 months of which may be petrale sole.	70,000 lb/ 2 months, no more than 18,000 lb/ 2 months of which may be petrale sole.	50,000 lb/ 2 months, no more than 18,000 lb/ 2 months of which may be petrale sole.	50,000 lb/ 2 months, no more than 10,000 lb/ 2 months of which may be petrale sole.
41	**Minor shelf rockfish[1/], Shortbelly, Widow & Yelloweye rockfish**				
42	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.			
43	large & small footrope gear	300 lb/ 2 months			
44	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
45	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 2-18. The status quo limited entry trawl trip limits and RCA restrictions north of 40°10' N latitude as of May 2008 (continued).

46	**Canary rockfish**						
47	large & small footrope gear	CLOSED					
48	selective flatfish trawl gear	100 lb/ month		300 lb/ month		100 lb/ month	
49	multiple bottom trawl gear 8/	CLOSED					
50	**Yellowtail**						
51	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.					
52	large & small footrope gear	300 lb/ 2 months					
53	selective flatfish trawl gear	2,000 lb/ 2 months					
54	multiple bottom trawl gear 8/	300 lb/ 2 months					
55	**Minor nearshore rockfish & Black rockfish**						
56	large & small footrope gear	CLOSED					
57	selective flatfish trawl gear	300 lb/ month					
58	multiple bottom trawl gear 8/	CLOSED					
59	**Lingcod 4/**						
60	large & small footrope gear	1,200 lb/ 2 months		4,000 lb/ 2 months			
61	selective flatfish trawl gear			1,200 lb/2 months			
62	multiple bottom trawl gear 8/						
63	**Pacific cod**	30,000 lb/ 2 months		70,000 lb/ 2 months			30,000 lb/ 2 months
64	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2 months	100,000 lb/ 2 months		
65	**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, and sand sole.
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 §§ 660.391-660.394.
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 2-19. The status quo limited entry trawl trip limits and RCA restrictions south of 40°10' N latitude as of May 2008.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
1	South of 40°10' N. lat.	100 fm - 150 fm[7/]					
	All trawl gear (large footrope, selective flatfish trawl, and small footrope trawl gear) is permitted seaward of the RCA. Large footrope trawl gear is prohibited shoreward 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 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).						
	State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
2	**Minor slope rockfish[2/] & Darkblotched rockfish**						
3	40°10' - 38° N. lat.	15,000 lb/ 2 months					
4	South of 38° N. lat.	55,000 lb/ 2 months					
5	**Splitnose**						
6	40°10' - 38° N. lat.	15,000 lb/ 2 months			10,000 lb/ 2 months		15,000 lb/ 2 months
7	South of 38° N. lat.	40,000 lb/ 2 months					
8	**DTS complex**						
9	Sablefish	14,000 lb/ 2 months		19,000 lb/ 2 months			14,000 lb/ 2 months
10	Longspine thornyhead	25,000 lb/ 2 months					
11	Shortspine thornyhead	12,000 lb/ 2 months		25,000 lb/ 2 months			
12	Dover sole	80,000 lb/ 2 months					
13	**Flatfish** (except Dover sole)						
14	Other flatfish[3/], English sole, & starry flounder	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
15	Petrale sole	50,000 lb/ 2 months					50,000 lb/ 2 months
16	Arrowtooth flounder	10,000 lb/ 2 months					
17	**Whiting**						
18	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.					
19	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.					

Table 2-19. The status quo limited entry trawl trip limits and RCA restrictions south of 40°10' N latitude as of May 2008 (continued).

20	**Minor shelf rockfish[1/], Chilipepper, Shortbelly, Widow, & Yelloweye rockfish**			
21	large footrope or midwater trawl for Minor shelf rockfish & Shortbelly	300 lb/ month		
22	large footrope or midwater trawl for Chilipepper	2,000 lb/ 2 months	12,000 lb/ 2 months	8,000 lb/ 2 months
23	large footrope or midwater trawl for Widow & Yelloweye	CLOSED		
24	small footrope trawl for Minor Shelf, Shortbelly, Widow & Yelloweye	300 lb/ month		
25	small footrope trawl for Chilipepper	2,000 lb/ 2 months		
26	**Bocaccio**			
27	large footrope or midwater trawl	300 lb/ 2 months		
28	small footrope trawl	CLOSED		
29	**Canary rockfish**			
30	large footrope or midwater trawl	CLOSED		
31	small footrope trawl	100 lb/ month	300 lb/ month	100 lb/ month
32	**Cowcod**	CLOSED		
33	**Minor nearshore rockfish & Black rockfish**			
34	large footrope or midwater trawl	CLOSED		
35	small footrope trawl	300 lb/ month		
36	**Lingcod[4/]**			
37	large footrope or midwater trawl	1,200 lb/ 2 months	4,000 lb/ 2 months	
38	small footrope trawl		1,200 lb/ 2 months	
39	**Pacific cod**	30,000 lb/ 2 months	70,000 lb/ 2 months	30,000 lb/ 2 months
40	**Spiny dogfish**	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months
41	**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, and sand sole.
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 §§ 660.391-660.394.
7/ South of 34°27' N. lat., the RCA is 100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

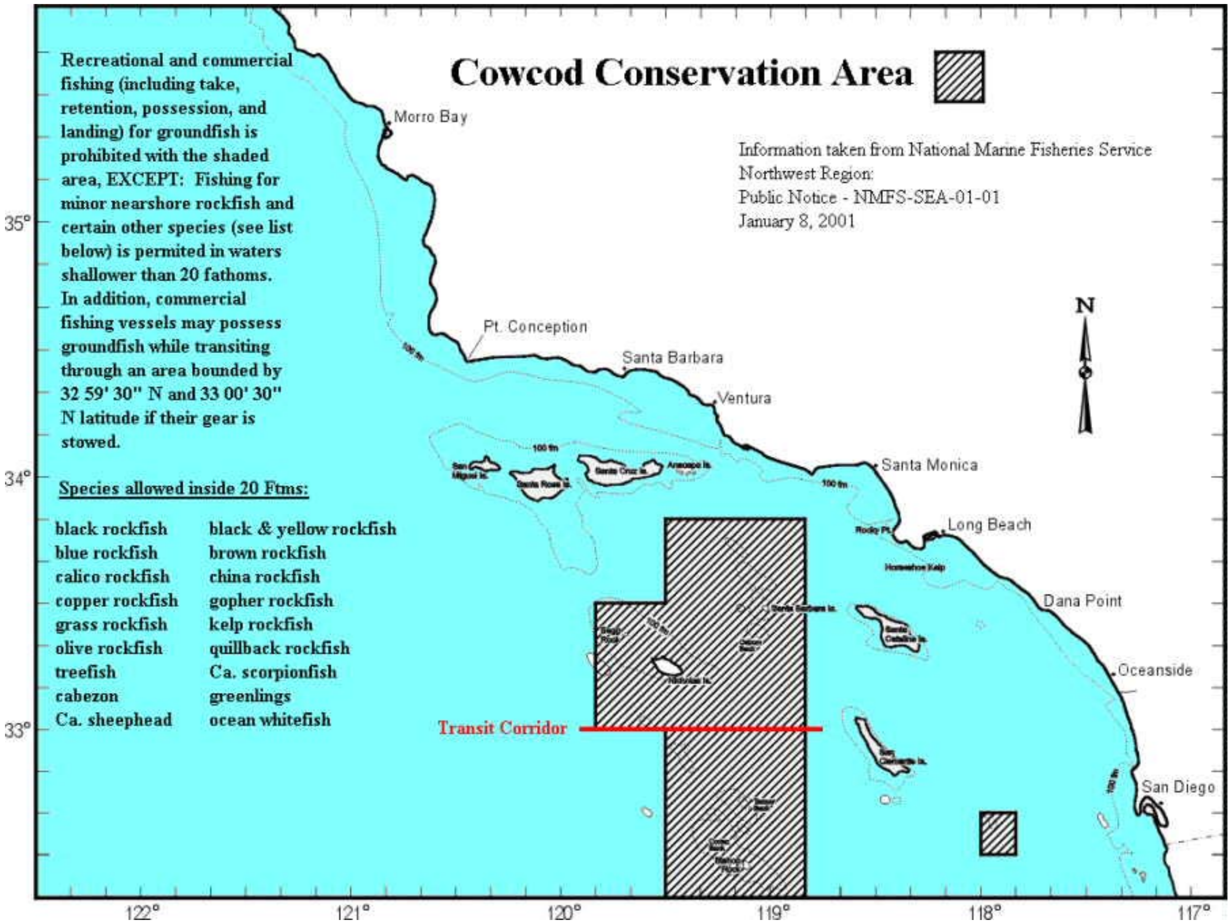

Figure 2-5. The current Cowcod Conservation Areas located in the Southern California Bight.

Limited Entry Whiting

A Pacific whiting OY of 269,545 mt was used to manage 2008 West Coast whiting fisheries and forms the basis for the No Action Alternative. The 2008 tribal allocation was set at 35,000 mt, based on the sliding scale allocation formula shown in Table 2-20. An additional 2,000 mt of whiting was set aside from the U.S. OY to accommodate research catch and incidental bycatch in non-whiting fisheries. This left approximately 232,545 mt for the non-tribal whiting fleets. Under the fixed allocations for these fleets specified in the FMP and in Federal regulations, the 2008 whiting quotas were 97,669 mt (42%) for the shoreside whiting sector, 55,811 mt (24%) for the at-sea mothership sector, and 79,065 mt (34%) for the at-sea catcher-processor sector.

The Council also adopted total catch bycatch limits for the non-tribal sectors of the whiting fishery of 4.7 mt of canary rockfish, 275 mt of widow rockfish, and 40 mt of darkblotched rockfish. If any of these total catch limits are attained inseason, the fishery closes for the non-tribal whiting fleets even if whiting quotas have not been attained. The total catch limit of darkblotched was higher than that specified in 2007 to provide an incentive for the whiting fleets to fish deeper to avoid canary and widow rockfish.

Table 2-20. The status quo tribal whiting allocation based on a sliding scale of the U.S. OY.

Whiting OY Range		Tribal Share
More Than	Less Than	
0 mt	145,000 mt	15% of the commercial OY
145,000 mt	175,000 mt	25,000 mt
175,000 mt	200,000 mt	27,500 mt
200,000 mt	225,000 mt	30,000 mt
225,000 mt	250,000 mt	32,500 mt
250,000 mt	-	35,000 mt

The 2007 shoreside whiting fishery operated under an EFP, which allowed full retention in the fishery among other exemptions from Federal limited entry trawl regulations. Final rulemaking for FMP Amendment 10, which will implement maximized retention regulations and a monitoring program for the shoreside whiting fishery, is anticipated in 2008 before the start of the shoreside whiting fishery on June 15. An EFP process was initiated by NMFS in 2008 in case Amendment 10 rulemaking is delayed. Amendment 10 rules may also address maximized retention rules for catcher vessels delivering to motherships and a rule allowing NMFS to close the non-tribal whiting fisheries if a bycatch limit is projected to be attained inseason. These two issues are also addressed in 2009-10 specifications and management measures in the event that final Amendment 10 rules do not address these issues (see section 2.2.4.2 for more details).

In 2007, the Council and NMFS implemented the Ocean Salmon Conservation Zone and rules that gave NMFS the authority to implement a nearshore closure (seaward of the 100 fm management line) for all sectors of the whiting fishery if Chinook take exceeds acceptable levels. The incidental take level for Chinook salmon can change through the Endangered Species Act consultation process if needed.

Limited Entry Fixed Gear

Limited entry fixed gear trip limits and the non-trawl RCA configuration as of May 2008 describe the No Action Alternative and are shown in Tables 2-21 (north of 40°10' N latitude) and 2-22 (south of 40°10' N latitude). Under the No Action Alternative, the non-trawl 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 non-trawl 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. 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 non-trawl 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 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 2008 sablefish tier limits are as follows: tier 1 = 48,500 lb, tier 2 = 22,000 lb, and tier 3 = 12,500 lb.

A new YRCA in the Washington North Coast area, labeled North Coast Area B (Figure 2-6), was implemented in 2007. Limited entry fixed gear fishermen were prohibited from fishing in the North Coast B YRCA in 2007-08. The South Coast B YRCA (Figure 2-4) and the “C-shaped” YRCA in waters off northern Washington (Figure 2-7) were voluntary “areas to be avoided” for commercial limited entry fixed gear fishermen. Limited entry fixed gears were not allowed to be fished in the Cowcod Conservation Areas (CCAs) (Figure 2-5) under the No Action Alternative, except for some nearshore commercial fishing opportunities described in the next section.

Coordinates defining these YRCAs are provided in Federal regulations at 50 CFR 660.390.

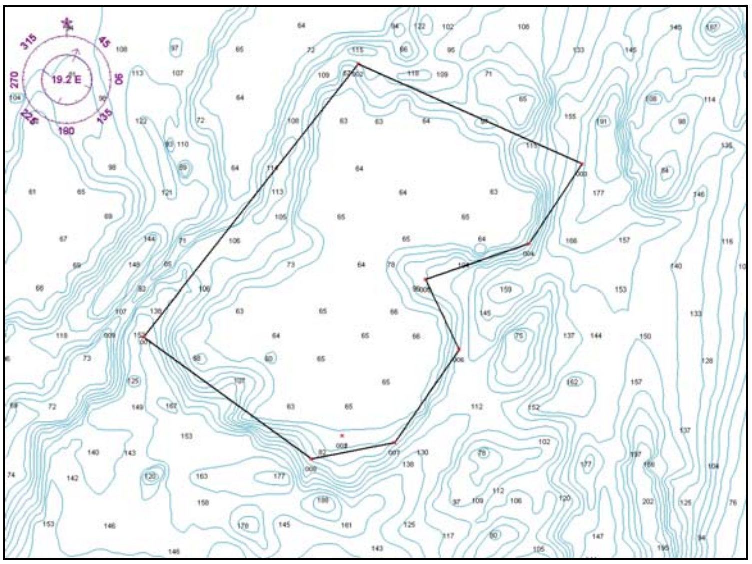

Figure 2-6. A Yelloweye Rockfish Conservation Area (North Coast B) in waters off the Washington north coast where limited entry and open access fixed gear fishing was prohibited in 2007-08.

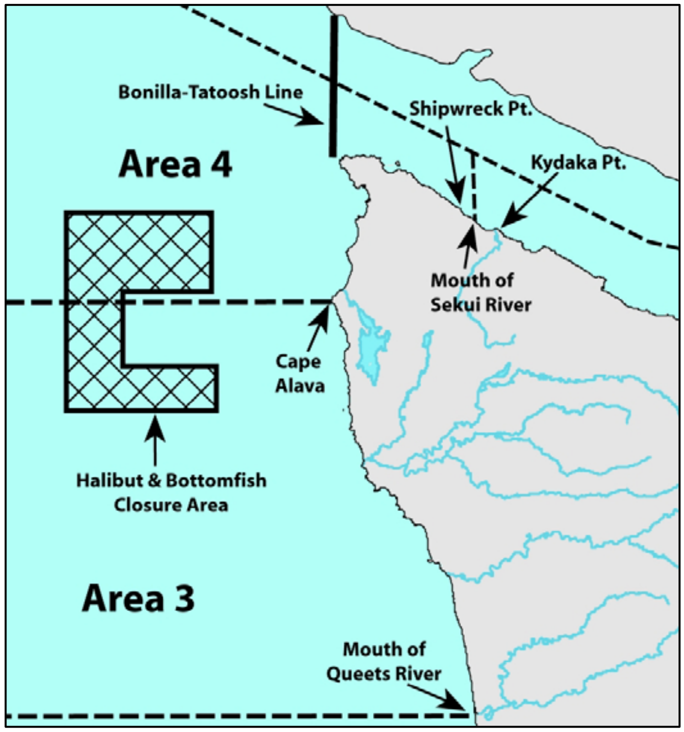

Figure 2-7. The current "C-shaped" Yelloweye Rockfish Conservation Area in waters off northern Washington where recreational groundfish and Pacific halibut fishing was prohibited in 2007-08. Commercial limited entry and open access fixed gear fleets were asked to voluntarily avoid fishing in this YRCA in 2007-08.

Table 2-21. The status quo limited entry fixed gear trip limits and RCA restrictions north of 40°10' N latitude as of May 2008.

<table>
<tr><th></th><th></th><th>JAN-FEB</th><th>MAR-APR</th><th>MAY-JUN</th><th>JUL-AUG</th><th>SEP-OCT</th><th colspan="2">NOV-DEC</th></tr>
<tr><td colspan="2">Rockfish Conservation Area (RCA)6/:</td><td colspan="7"></td></tr>
<tr><td>1</td><td>North of 46°16' N. lat.</td><td colspan="7">shoreline - 100 fm</td></tr>
<tr><td>2</td><td>46°16' N. lat. - 40°10' N. lat.</td><td colspan="7">30 fm - 100 fm</td></tr>
<tr><td colspan="9">See § 660.370 and § 660.382 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).</td></tr>
<tr><td colspan="9">State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.</td></tr>
<tr><td>3</td><td>Minor slope rockfish 2/ & Darkblotched rockfish</td><td colspan="7">4,000 lb/ 2 months</td></tr>
<tr><td>4</td><td>Pacific ocean perch</td><td colspan="7">1,800 lb/ 2 months</td></tr>
<tr><td>5</td><td>Sablefish</td><td colspan="7">300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months</td></tr>
<tr><td>6</td><td>Longspine thornyhead</td><td colspan="7">10,000 lb/ 2 months</td></tr>
<tr><td>7</td><td>Shortspine thornyhead</td><td colspan="7">2,000 lb/ 2 months</td></tr>
<tr><td>8</td><td>Dover sole</td><td colspan="7" rowspan="6">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.</td></tr>
<tr><td>9</td><td>Arrowtooth flounder</td></tr>
<tr><td>10</td><td>Petrale sole</td></tr>
<tr><td>11</td><td>English sole</td></tr>
<tr><td>12</td><td>Starry flounder</td></tr>
<tr><td>13</td><td>Other flatfish 1/</td></tr>
<tr><td>14</td><td>Whiting</td><td colspan="7">10,000 lb/ trip</td></tr>
<tr><td>15</td><td>Minor shelf rockfish 2/, Shortbelly, Widow, & Yellowtail rockfish</td><td colspan="7">200 lb/ month</td></tr>
<tr><td>16</td><td>Canary rockfish</td><td colspan="7">CLOSED</td></tr>
<tr><td>17</td><td>Yelloweye rockfish</td><td colspan="7">CLOSED</td></tr>
<tr><td>18</td><td>Minor nearshore rockfish & Black rockfish</td><td colspan="7"></td></tr>
<tr><td>19</td><td>North of 42° N. lat.</td><td colspan="7">5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish 3/</td></tr>
<tr><td>20</td><td>42° - 40°10' N. lat.</td><td colspan="7">6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish 3/</td></tr>
<tr><td>21</td><td>Lingcod 4/</td><td colspan="2">CLOSED</td><td colspan="3">800 lb/ 2 months</td><td>400 lb/ month</td><td>CLOSED</td></tr>
<tr><td>22</td><td>Pacific cod</td><td colspan="7">1,000 lb/ 2 months</td></tr>
<tr><td>23</td><td>Spiny dogfish</td><td colspan="2">200,000 lb/ 2 months</td><td>150,000 lb/ 2 months</td><td colspan="4">100,000 lb/ 2 months</td></tr>
<tr><td>24</td><td>Other fish 5/</td><td colspan="7">Not limited</td></tr>
</table>

1/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole.
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 22 inches (56 cm) total length North of 42° N. lat. and 24 inches (61 cm) total length south of 42° N. lat.
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 §§ 660.391-660.394.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-22. The status quo limited entry fixed gear trip limits and RCA restrictions south of 40°10' N latitude as of May 2008.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
1	40°10' - 34°27' N. lat.	30 fm - 150 fm					
2	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 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).						
	State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
3	**Minor slope rockfish[2/] & Darkblotched rockfish**	40,000 lb/ 2 months					
4	**Splitnose**	40,000 lb/ 2 months					
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					
7	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
8	**Longspine thornyhead**	10,000 lb / 2 months					
9	**Shortspine thornyhead**						
10	40°10' - 34°27' N. lat.	2,000 lb/ 2 months					
11	South of 34°27' N. lat.	3,000 lb/ 2 months					
12	**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.					
13	**Arrowtooth flounder**						
14	**Petrale sole**						
15	**English sole**						
16	**Starry flounder**						
17	**Other flatfish[1/]**						
18	**Whiting**	10,000 lb/ trip					
19	**Minor shelf rockfish[2/], Shortbelly, Widow rockfish, and Bocaccio (including Chilipepper between 40°10' - 34°27' N. lat.)**						
20	40°10' - 34°27' N. lat.	Minor shelf rockfish, shortbelly, widow rockfish, bocaccio & chilipepper: 2,500 lb/ 2 months, of which no more than 500 lb/ 2 months may be any species other than chilipepper.					
21	South of 34°27' N. lat.	3,000 lb/ 2 months	CLOSED	3,000 lb/ 2 months			
22	**Chilipepper rockfish**						
23	40°10' - 34°27' N. lat.	Chilipepper included under minor shelf rockfish, shortbelly, widow and bocaccio limits - - See above					
24	South of 34°27' N. lat.	2,000 lb/ 2 months, this opportunity only available seaward of the nontrawl RCA					
25	**Canary rockfish**	CLOSED					
26	**Yelloweye rockfish**	CLOSED					
27	**Cowcod**	CLOSED					
28	**Bocaccio**						
29	40°10' - 34°27' N. lat.	Bocaccio included under Minor shelf rockfish, shortbelly, widow & chilipepper limits -- See above					
30	South of 34°27' N. lat.	300 lb/ 2 months	CLOSED	300 lb/ 2 months			

Table 2-22. The status quo limited entry fixed gear trip limits and RCA restrictions south of 40°10' N latitude as of May 2008 (continued).

31	**Minor nearshore rockfish & Black rockfish**						
32	Shallow nearshore	600 lb/ 2 months	CLOSED	800 lb/ 2 months	900 lb/ 2 months	800 lb/ 2 months	600 lb/ 2 months
33	Deeper nearshore						
34	40°10' - 34°27' N. lat.	700 lb/ 2 months	CLOSED	700 lb/ 2 months		600 lb/ 2 months	700 lb/ 2 months
35	South of 34°27' N. lat.	500 lb/ 2 months		600 lb/ 2 months			
36	California scorpionfish	600 lb/ 2 months	CLOSED	600 lb/ 2 months	800 lb/ 2 months		600 lb/ 2 months
37	**Lingcod**[3/]	CLOSED		800 lb/ 2 months			400 lb/ month; CLOSED
38	**Pacific cod**	1,000 lb/ 2 months					
39	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2 months	100,000 lb/ 2 months		
40	**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, and sand sole.
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 §§ 660.391-660.394, except that the 20-fm depth contour off California is defined by the depth contour and not coordinates.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Directed Open Access

Directed open access fisheries are those West Coast commercial fisheries comprised of vessels without a Federal limited entry permit (trawl or fixed gear) that target groundfish. 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 CCAs (Figure 2-5) under the No Action Alternative, except for some nearshore commercial fishing opportunities described below.

There are directed groundfish fisheries that target nearshore species and those operating on the shelf and slope primarily targeting sablefish (daily-trip-limit fishery), shortspine thornyhead, and slope rockfish species.

Open access trip limits and estimated impacts of 2008 management measures as of May 2008 describe the No Action Alternative and are shown in Tables 2-23 (north of 40°10' N latitude) and 2-24 (south of 40°10' N latitude). The same non-trawl RCA described for limited entry fixed gears under the No Action Alternative above would also apply for those open access fisheries not exempt from the RCA restrictions.

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. 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 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.

Under the No Action Alternative, the non-trawl 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.

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.

Under the No Action Alternative, the non-trawl 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. 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 non-trawl 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 fixed gear fisheries, including those targeting nearshore groundfish species, under the No Action Alternative.

A new YRCA in the Washington North Coast area, labeled North Coast Area B (Figure 2-6), was implemented in 2007. Open access fixed gear fishermen were prohibited from fishing in the North Coast B YRCA in 2007-08. The South Coast B YRCA (Figure 2-4) and the “C-shaped” YRCA in waters off northern Washington (Figure 2-7) were voluntary “areas to be avoided” for commercial open access fixed gear fishermen.

There is some nearshore commercial fishing allowed in the CCAs (Figure 2-5) in depths shallower than 20 fm under the No Action Alternative. Only southern minor nearshore rockfish, (both shallow and deeper nearshore rockfish), California scorpionfish, cabezon, greenlings, California sheephead, and ocean whitefish are allowed to be retained in depths <20 fm in the CCAs.

Coordinates defining these YRCAs are provided in Federal regulations at 50 CFR 660.390.

Table 2-23. The status quo open access trip limits and RCA restrictions north of 40°10' N latitude as of May 2008.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
1	North of 46°16' N. lat.	shoreline - 100 fm					
2	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 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).						
	State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
3	**Minor slope rockfish[1/] & Darkblotched rockfish**	Per trip, no more than 25% of weight of the sablefish landed					
4	**Pacific ocean perch**	100 lb/ month					
5	**Sablefish**	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,400 lb/ 2 months		300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,200 lb/ 2 months			
6	**Thornyheads**	CLOSED					
7	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. 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.					
8	**Arrowtooth flounder**						
9	**Petrale sole**						
10	**English sole**						
11	**Starry flounder**						
12	**Other flatfish[2/]**						
13	**Whiting**	300 lb/ month					
14	**Minor shelf rockfish[1/], Shortbelly, Widow, & Yellowtail rockfish**	200 lb/ month					
15	**Canary rockfish**	CLOSED					
16	**Yelloweye rockfish**	CLOSED					
17	**Minor nearshore rockfish & Black rockfish**						
18	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/]					
19	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/]					
20	**Lingcod[4/]**	CLOSED		400 lb/ month			CLOSED
21	**Pacific cod**	1,000 lb/ 2 months					
22	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2 months	100,000 lb/ 2 months		
23	**Other Fish[5/]**	Not limited					

Table 2-23. The status quo open access trip limits and RCA restrictions north of 40°10' N latitude as of May 2008 (continued).

24	**PINK SHRIMP NON-GROUNDFISH TRAWL** *(not subject to RCAs)*	
25	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.
26	**SALMON TROLL**	
27	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, and sand sole.
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 minimum size limit for lingcod is 22 inches (56 cm) total length North of 42° N. lat. and 24 inches (61 cm) total length south of 42° N. lat.
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 §§ 660.391-660.394.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-24. The status quo open access trip limits and RCA restrictions north of 40°10' N latitude as of May 2008.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
1	40°10' - 34°27' N. lat.	30 fm - 150 fm					
2	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 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).						
	State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
3	**Minor slope rockfish[1/] & Darkblotched rockfish**						
4	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
5	South of 38° N. lat.	10,000 lb/ 2 months					
6	**Splitnose**	200 lb/ month					
7	**Sablefish**						
8	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,400 lb/ 2 months		300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,200 lb/ 2 months			
9	South of 36° N. lat.	300 lb/ day, or 1 landing per week of up to 700 lb					
10	**Thornyheads**						
11	40°10' - 34°27' N. lat.	CLOSED					
12	South of 34°27' N. lat.	50 lb/ day, no more than 1,000 lb/ 2 months					
13	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. 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.					
14	**Arrowtooth flounder**						
15	**Petrale sole**						
16	**English sole**						
17	**Starry flounder**						
18	**Other flatfish[2/]**						
19	**Whiting**	300 lb/ month					
20	**Minor shelf rockfish[1/], Shortbelly, Widow & Chilipepper rockfish**						
21	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED	200 lb/ 2 months		300 lb/ 2 months	
22	South of 34°27' N. lat.	750 lb/ 2 months	CLOSED	750 lb/ 2 months			
23	**Canary rockfish**	CLOSED					
24	**Yelloweye rockfish**	CLOSED					
25	**Cowcod**	CLOSED					
26	**Bocaccio**						
27	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED	100 lb/ 2 months		200 lb/ 2 months	
28	South of 34°27' N. lat.	100 lb/ 2 months	CLOSED	100 lb/ 2 months			

Table 2-24. The status quo open access trip limits and RCA restrictions north of 40°10' N latitude as of May 2008 (continued).

29	**Minor nearshore rockfish & Black rockfish**						
30	Shallow nearshore	600 lb/ 2 months	CLOSED	800 lb/ 2 months	900 lb/ 2 months	800 lb/ 2 months	600 lb/ 2 months
31	Deeper nearshore						
32	40°10' - 34°27' N. lat.	700 lb/ 2 months	CLOSED	700 lb/ 2 months		600 lb/ 2 months	700 lb/ 2 months
33	South of 34°27' N. lat.	500 lb/ 2 months		600 lb/ 2 months			
34	California scorpionfish	600 lb/ 2 months	CLOSED	600 lb/ 2 months	800 lb/ 2 months		600 lb/ 2 months
35	**Lingcod**[3/]	CLOSED		400 lb/ month			CLOSED
36	**Pacific cod**	1,000 lb/ 2 months					
37	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2 months	100,000 lb/ 2 months		
38	**Other Fish**[4/] **& Cabezon**	Not limited					
39	**RIDGEBACK PRAWN AND, SOUTH OF 38°57.50' N. LAT., CA HALIBUT AND SEA CUCUMBER NON-GROUNDFISH TRAWL**						
40	**NON-GROUNDFISH TRAWL Rockfish Conservation Area (RCA) for CA Halibut, Sea Cucumber & Ridgeback Prawn:**						
41	40°10' - 38° N. lat.	100 fm - modified 200 fm [6/]	100 fm - 150 fm				100 fm - modified 200 fm [6/]
42	38° - 34°27' N. lat.	100 fm - 150 fm					
43	South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands					
44		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°57.50' 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).					
45	**PINK SHRIMP NON-GROUNDFISH TRAWL GEAR** *(not subject to RCAs)*						
46	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.					

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, and sand sole.
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 §§ 660.391-660.394, except that the 20-fm depth contour off California is defined by the depth contour and not coordinates.
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.

Incidental Open Access

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.

Commercial salmon trolling was prohibited in a new YRCA in waters off northern Washington in 2007-08 (Figure 2-8).

Coordinates defining this YRCA is provided in Federal regulations at 50 CFR 660.390.

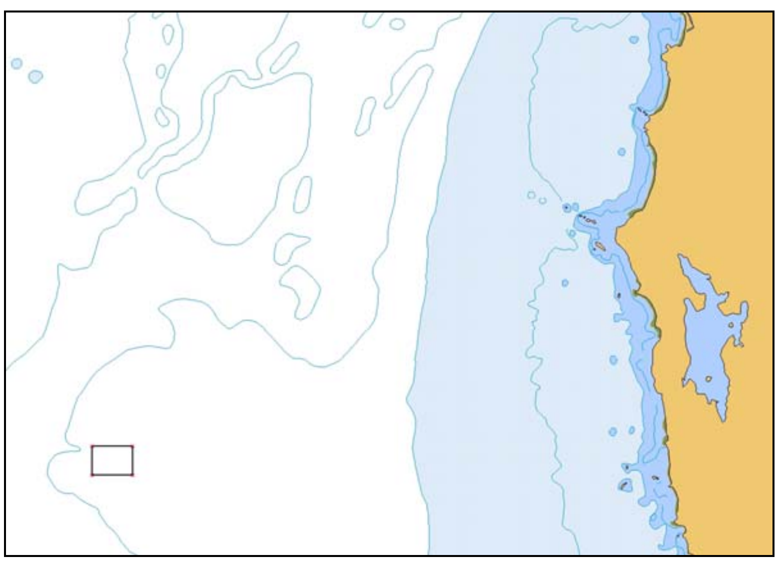

Figure 2-8. A Yelloweye Rockfish Conservation Area off the north Washington coast where commercial salmon trolling was prohibited in 2007-08.

Tribal

The following regulations applied to 2007-08 tribal groundfish fisheries.

Black Rockfish - The 2007 and 2008 tribal harvest guidelines were 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 were specified for the management area between Cape Alava and Destruction Island.

Sablefish - The 2007 and 2008 tribal set asides for sablefish were 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 were determined by the tribes.

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

For all other tribal groundfish fisheries the following trip limits applied:

Thornyheads - Tribal fisheries were restricted to the limited entry trip limits in place at the beginning of the year for both shortspine and longspine thornyheads, which were 7,500 lbs per 2 months shortspine thornyhead and 22,000 lbs per 2 months for longspine thornyhead.

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

Other Minor Nearshore, Shelf and Slope Rockfish - Tribal fisheries were restricted to a 300 pound per 2 month trip limit for each species group.

Yelloweye Rockfish - Tribal fisheries were restricted to 100 pounds per trip.

Lingcod - Tribal fisheries were restricted to 600 pound per day and 1,800 pound per week limits 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. Prior to the 2008 season, the tribes adopted a 250 mt annual harvest guideline.

Spiny Dogfish - The Makah Tribe proposed a directed longline fishery for spiny dogfish for 2007 and 2008. The fishery would be restricted to the Limited Entry trip limits. However, the Makah Tribe has not implemented a directed longline fishery for spiny dogfish as of May 2008.

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

<u>Tribal Regulations Regarding Makah Trawl fisheries for 2007 and 2008</u>

Midwater Trawl Fishery - Treaty midwater trawl fishermen were 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 could not exceed 10 percent of the poundage of yellowtail rockfish landed in any given period. The tribe had the ability to adjust the cumulative limit for any two-month period to minimize the incidental catch of canary and widow rockfish, provided the average cumulative limit did not exceed 180,000 pounds for the fleet.

Bottom Trawl Fishery - Treaty fishermen using bottom trawl gear were 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 were combined across periods and the fleet to create a cumulative harvest target. The limits available to individual fishermen were then adjusted inseason to stay within the overall harvest target as well as estimated impacts to overfished species. For petrale sole, fishermen were 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 were those in place at the beginning of the season in the limited entry fishery and were not adjusted downward, nor were time restrictions or closures imposed, unless in-season catch statistics had demonstrated that the tribe had taken half of the harvest in the tribal area. Fishermen were restricted to small footrope (≤ 8 inches) trawl gear. Exploration of the use of selective flatfish trawl gear was conducted in 2006.

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

Washington Recreational

Washington and Oregon shared harvest guidelines for canary and yelloweye rockfish of 8.2 mt and 6.8 mt, respectively in 2007-08. Washington's share of the canary harvest guideline was 1.7 mt and that of yelloweye was 3.5 mt. If either of these harvest guidelines were attained inseason, the WDFW and ODFW would consult and decide if inseason state actions would be needed to maintain impacts within these harvest guidelines. Such state management actions would include closing recreational fisheries, restricting recreational fishery seasons, and/or restricting the depths where the fishery was allowed to continue. In 2007, a 1.5 mt residual yield of yelloweye rockfish was reserved for managing all the recreational fisheries coastwide as the first priority. The Council was able to use this residual yield to keep any of the coastwide recreational fisheries open. If this yield was not needed for maintaining 2007-2008 recreational fisheries, the Council would be able to use this residual yield to maintain commercial fisheries (see the discussion under California Recreational for more details).

The following seasons, bag limits, size limits, and area restrictions also applied to 2007 and 2008 Washington recreational groundfish fisheries.

<u>The 2007-08 Washington Recreational Groundfish Season</u>

The 2007-08 Washington recreational groundfish season is displayed in Figure 2-9. The fishery was much more restricted in marine management areas 3 and 4 north of the Queets River where canary and yelloweye rockfish are more abundant and therefore caught incidentally at a higher rate.

<table>
<tr><th>Marine Area</th><th colspan="2">Jan</th><th colspan="2">Feb</th><th colspan="2">Mar</th><th colspan="2">Apr</th><th colspan="2">May</th><th colspan="2">June</th><th colspan="2">July</th><th colspan="2">Aug</th><th colspan="2">Sep</th><th colspan="2">Oct</th><th colspan="2">Nov</th><th colspan="2">Dec</th></tr>
<tr><td>3 & 4 (N. Coast)</td><td colspan="9">Open all depths</td><td colspan="9">Open <20 fm May 21-Sep 30 a/</td><td colspan="6">Open all depths</td></tr>
<tr><td>2 (S. Coast)</td><td colspan="5">Open all depths</td><td colspan="6">Open <30 fm Mar 15 - June 15 b/</td><td colspan="13">Open all depths</td></tr>
<tr><td>1 (Col. R.)</td><td colspan="8">Open all depths</td><td colspan="10">Open all depths c/</td><td colspan="6">Open all depths</td></tr>
<tr><td colspan="25">a/ Groundfish retention allowed >20 fm on days when Pacific halibut is open.
b/ Retention of sablefish and Pacific cod allowed seaward of 30 fm from May 1- June 15.
c/ Retention of groundfish, except sablefish and Pacific cod, prohibited with Pacific halibut on board from May 1 - September 30.</td></tr>
</table>

Figure 2-9. The status quo Washington recreational groundfish season by marine management area in 2008.

2007-08 Bag and Size Limits

The Washington recreational groundfish fishery bag limit was 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 22-inch minimum size during the open lingcod season.

2007-08 Area Restrictions

The 2007-08 Washington recreational groundfish and Pacific halibut fisheries were restricted from the "C-shaped" YRCA in waters off northern Washington (Figure 2-7).

An additional YRCA in the Washington South Coast area, labeled South Coast Area B was implemented beginning in 2007 (Figure 2-4) This area was closed to recreational fishing for groundfish and Pacific halibut and also was a voluntary "area to be avoided" for commercial groundfish fisheries.

Coordinates defining these YRCAs are provided in Federal regulations at 50 CFR 660.390.

Oregon Recreational

Oregon and Washington shared harvest guidelines for canary and yelloweye rockfish of 8.2 mt and 6.8 mt, respectively in 2007-08. Oregon's share of the canary harvest guideline was 6.5 mt and that of yelloweye was 3.3 mt. If either of these harvest guidelines were attained inseason, the ODFW and WDFW would consult and decide if inseason state actions would be needed to maintain impacts within these harvest guidelines. Such state management actions included closing recreational fisheries, restricting recreational fishery seasons, and/or restricting the depths where the fishery was allowed to continue. In 2007, a 1.5 mt residual yield of yelloweye rockfish was reserved for managing all the recreational fisheries coastwide as the first priority. The Council was able to use this residual yield to keep any of the coastwide recreational fisheries open. If this yield was not needed for maintaining 2007-2008 recreational fisheries, the Council would be able to use this residual yield to maintain commercial fisheries.

The following seasons, bag limits, size limits, and area restrictions also applied to 2007 and 2008 Oregon recreational groundfish fisheries.

The 2007-08 Oregon Recreational Groundfish Season

The 2007-08 Oregon recreational groundfish fishery was open year round, but restricted to depths shallower than 40 fm from April through September to reduce impacts on canary and yelloweye rockfish (Figure 2-10).

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Open all depths			Open <40 fm						Open all depths		

Figure 2-10. The status quo Oregon recreational groundfish season in 2008.

2007-08 Bag and Size Limits

A marine fish daily bag limit of 8 fish in aggregate was allowed in 2007-08 Oregon recreational fisheries. The marine bag included 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. A flatfish daily bag limit of 25, which includes all soles and flounders except Pacific halibut, was allowed in addition to the marine fish daily bag limit.

Retention of canary and yelloweye rockfish was prohibited in 2007-08.

The following minimum size limits applied to 2007-08 Oregon recreational fisheries:

- lingcod – 22 in.
- cabezon – 16 in.
- kelp greenling – 10 in.

<u>2007-08 Area Restrictions</u>

A YRCA has been in place on Stonewall Bank since 2006 (Figure 2-11). No recreational fishing for groundfish and Pacific halibut can occur within this YRCA, which is bounded by the following waypoints:

44°37.458’ N lat.	124°24.918’ W long.
44°37.458’ N lat.	124°23.628’ W long.
44°28.71’ N lat.	124°21.798’ W long.,
44°28.71’ N lat.	124°24.102’ W long.,
44°31.422’ N lat.	124°25.5’ W long.

Stonewall Bank - Yelloweye Rockfish Conservation

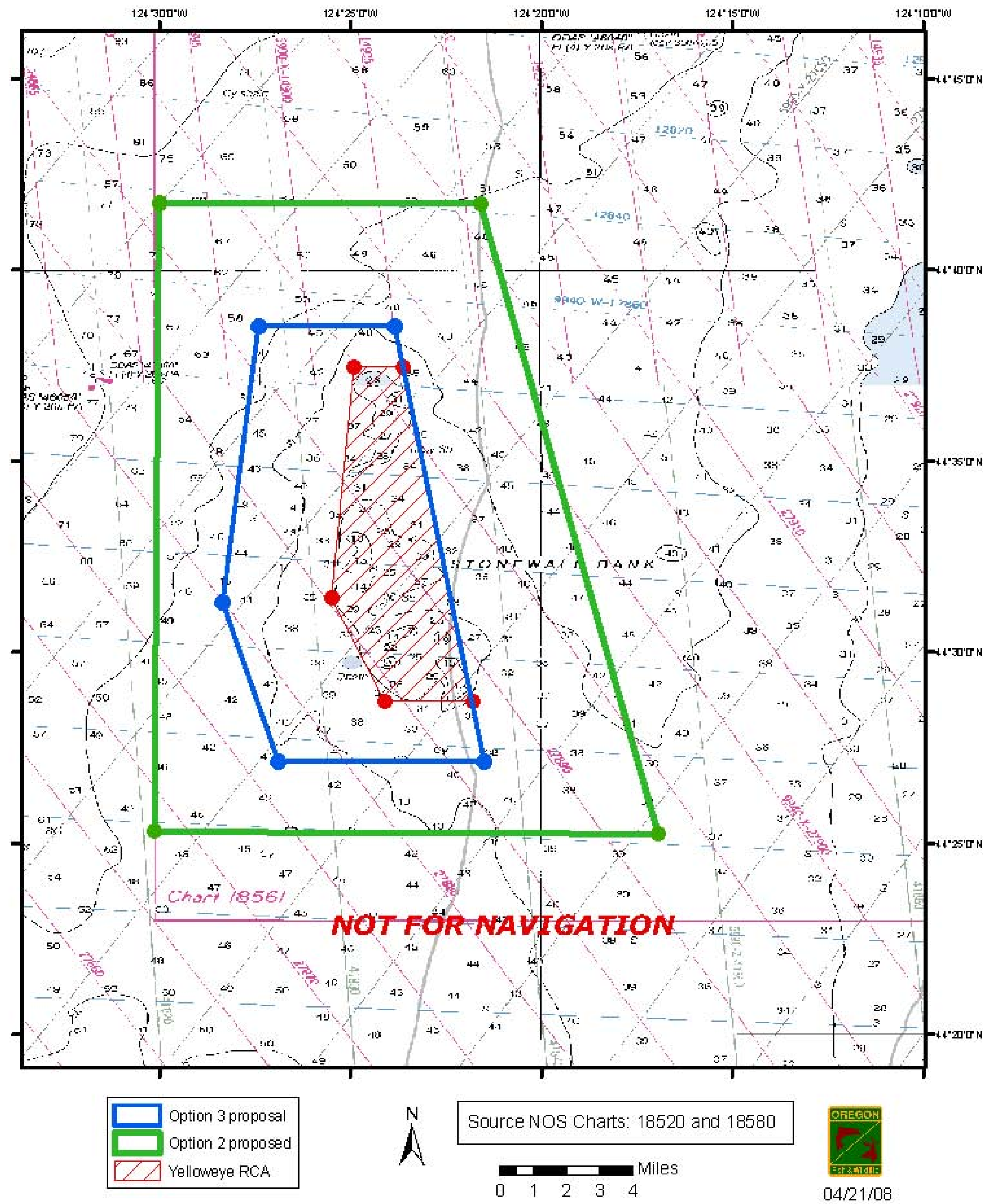

Figure 2-11. The Stonewall Bank Yelloweye Rockfish Conservation Area where recreational fishing for groundfish and Pacific halibut is prohibited. Two possible extensions to the Stonewall Bank YRCA considered for 2009-10 are also shown.

California Recreational

The 2007 and 2008 California recreational groundfish fisheries were managed under annual harvest guidelines for canary and yelloweye rockfish of 9.0 mt and 2.1 mt, respectively. If either of these harvest guidelines were attained inseason, the CDFG would enact management actions, including closing recreational fisheries, restricting recreational fishery seasons, and/or restricting the depths where the fishery was allowed to continue. In 2007, a 1.5 mt residual yield of yelloweye rockfish was reserved for managing all the recreational fisheries coastwide as the first priority. The Council was able to use this residual yield to keep any of the coastwide recreational fisheries open. If this yield was not needed for maintaining 2007-2008 recreational fisheries, the Council would be able to use this residual yield to maintain commercial fisheries. This yield was needed to manage 2007 recreational fisheries after the California recreational harvest of canary and yelloweye in the two northern management areas exceeded the respective harvest guidelines. CDFG closed the two northern areas on October 1, 2007, one and two months early for the North-Central and North management areas, respectively. Despite the inseason action, the 2.1 mt harvest guideline for yelloweye rockfish was exceeded by 5.9 mt and the 9 mt harvest guideline for canary rockfish was exceeded by 1.9 mt. The GMT estimated the total cumulative coastwide catch of both species was under their respective OYs.

The following seasons, bag limits, size limits, and area restrictions also applied to 2007 and 2008 California recreational groundfish fisheries.

<u>The 2007 and 2008 California Recreational Groundfish Seasons</u>

Figures 2-12 and 2-13 depict the status quo California recreational groundfish seasons by marine management area in 2007 and 2008, respectively. In 2007, the California recreational fishery exceeded the specified 2.1 mt yelloweye rockfish harvest guideline forcing an early closure of the fishery north of Pigeon Pt. to the Oregon-California border on October 1, 2007. The yelloweye catch in the 2007 fishery was estimated to be 8.0 mt.

To reduce the risk of again exceeding the yelloweye harvest guideline in 2008, the CDFG restricted the fishery to depths of less than 20 fm (i.e., the 20-30 fm depth zone was closed) in the North and North-Central management areas (Figure 2-13). CDFG will also more closely monitor the fishery inseason in 2008 to react more quickly to restrict the fishery if there is an escalating catch rate of yelloweye or canary rockfish that threatens to exceed prescribed harvest guidelines.

<table>
<tr><th>Management Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North</td><td colspan="4">CLOSED</td><td colspan="5">Open <30 fm</td><td colspan="3">CLOSED</td></tr>
<tr><td>North-Central</td><td colspan="5">CLOSED</td><td colspan="4">Open <30 fm</td><td colspan="3">CLOSED</td></tr>
<tr><td>Monterey South-Central</td><td colspan="4">CLOSED</td><td colspan="7">Open <40 fm</td><td>CLOSED</td></tr>
<tr><td>Morro Bay South-Central</td><td colspan="4">CLOSED</td><td colspan="7">Open <40 fm</td><td>CLOSED</td></tr>
<tr><td>South</td><td colspan="2">CLOSED</td><td colspan="10">Open <60 fm</td></tr>
</table>

Figure 2-12. The status quo California recreational groundfish season by marine management area in 2007.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED				Open <20 fm							
North-Central	CLOSED					Open <20 fm						CLOSED
Monterey South-Central	CLOSED				Open <40 fm							CLOSED
Morro Bay South-Central	CLOSED				Open <40 fm							CLOSED
South	CLOSED		Open <60 fm									

Figure 2-13. The status quo California recreational groundfish season by marine management area in 2008.

The sport fishery for Pacific sanddabs, using gear specified in Federal and state regulations (size #2 hooks or smaller), was exempt from the season closures and depth restrictions placed on other Federally-managed groundfish. Retention of species in the Other Flatfish complex was allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs. 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 were exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.
In the South Region, CA scorpionfish is open 12 months: 0-40 fm January-February, 0-60 fm in March-December.

2007-08 Bag and Size Limits

In 2007-08, the California recreational fishery was subject to a general bag limit of 20 fish. Within this general bag limit the following sublimits applied:

- 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*.
- a two-fish bag limit for bocaccio 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.
- a daily-bag-limit of two lingcod with a minimum size limit of 24 inches.

2007-08 Area Restrictions

Beyond the depth restrictions depicted in Figures 2-12 and 2-13, the following area restrictions applied to the 2007-08 California recreational fishery:

- waters of Cordell Bank less than 100 fm in depth were closed to fishing at all times.
- recreational fishing for groundfish was prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- fishing was not allowed within the CCAs (Figure 2-5), except shoreward of the 20 fm line where fishing was open for groundfish other than California scorpionfish, but including select non-groundfish species (California sheephead and ocean whitefish).

2.2.4.2 *Alternative 2009-10 Management Measure Alternatives*

The following 2009-10 management measure alternatives (by sector) were adopted by the Council in April 2008 for analysis. Analysis of the consequences to affected species can be found in section 4.5.4. Analysis of the socioeconomic consequences to affected groundfish fishing sectors and West Coast fishing communities can be found in Chapter 7.

Limited Entry Non-Whiting Trawl

Routine management measures such as alternative trip limits and trawl RCA adjustments are included in analyses provided in section 4.5.4.1. The following management measures are also analyzed and discussed in section 4.5.4.1 of this EIS.

<u>One Bottom Trawl Gear on Board North of 40°10' N Latitude</u>

The GMT has discussed the concept of only allowing a single bottom trawl gear on board several times in recent years. The GMT believes consideration of this measure is consistent with the Purpose and Need. The intention of the one bottom trawl gear on board discussion has been to increase the certainty that large footrope gear is not being used shoreward of the RCA. Large footrope trawl gear is better able to fish in rocky habitats and using this gear in shoreward areas tends to increase bycatch of overfished shelf species. In recent discussions, the GMT identified several issues that would need to be addressed before putting this type of regulation in place. In particular, if trawlers are held to a single trawl gear during a period, this may inadvertently result in increased trawl effort on the shelf for those vessels that currently fish both seaward and shoreward but are restricted to the smaller limits. In addition, switching between one trawl gear and another may force vessels to incur a cost that they currently do not incur, thus having an adverse economic impact to trawl vessels.

Additionally, sampling concerns in Oregon (approximately 2.6 percent of landings) are associated with the use of multiple trawl gears during one trip. Implementation of a one trawl gear onboard regulation would prevent this issue. Fish are not kept in separate holds by gear type and therefore samples taken at the dock cannot be associated to a specific gear or area fished (shoreward or seaward of the RCA). Gear and area codes cannot be recorded on fish tickets and logbooks when more than one gear is used. When samples cannot be linked to the gear and area fished, they are unable to be used which results in a loss of important information used in stock assessments.

Limited Entry Whiting Trawl

The following management measures are analyzed and discussed in section 4.5.4.2 of this EIS.

<u>Closing the Whiting Fishery Upon Projected Attainment of a Bycatch Limit</u>

The GMT believes that closing the whiting fishery upon projected attainment of a bycatch limit will reduce the risk of exceeding a specified bycatch limit. Closing upon projection of attainment may mean inadvertently exceeding the bycatch limit or coming in under the bycatch limit, due to imprecise projections. Closing before actually attaining the bycatch limit may result in leaving a portion of the whiting OY unharvested. However, closing upon actual attainment virtually guarantees that the bycatch limit will be exceeded, potentially jeopardizing the OY.

The Council requested that NMFS adopt the ability to close the whiting fishery when a bycatch limit is projected to be attained as part of the FMP Amendment 10 (Shore-Based Pacific Whiting Monitoring

Program) rulemaking at their September 2007 meeting. The Council decided to add this task to this analysis of 2009-10 management measures in April 2008 because the proposed rule for Amendment 10 was not yet published. If this rule is adopted by NMFS in the final Amendment 10 rule, then this item does not need to be addressed further.

Maximized Retention for Catcher Vessels Delivering to Motherships

Provisions for requiring maximized retention for whiting catcher vessels delivering to motherships are tracking and monitoring issues, which are directly related to the ability to manage the fisheries within the constraints of overfished species rebuilding plans. If action is not taken on this issue for 2009-10, the GMT would have uncertainty in the accuracy of the bycatch estimates for this sector, which operates in a fishery that is managed within bycatch limits.

NMFS indicated that the proposed language for Amendment 10, Shore-Based Pacific Whiting Monitoring Program, addresses this issue. If this issue is addressed in the final Amendment 10 rule, then this item does not need to be addressed further.

Unmonitored Midwater Trawling in the RCA

Existing regulations allow midwater trawl vessels targeting whiting to fish in the trawl RCA without monitoring/observers during all operations as long as they sort and discard to meet trip limits. Participants in this fishery are only subject to a 25 percent at-sea observation rate through WCGOP coverage. Modifying regulations to require vessels in this fishery to carry an observer during all operations within the RCA would is a tracking and monitoring issue, which directly relates to the ability to manage the fisheries within the constraints of overfished species rebuilding plans. Modifying regulations in order to insure that trawl vessels targeting whiting in the RCA are monitored 100 percent of the time would provide accountability for overfished stocks that may be encountered in this fishery. Targeting whiting outside the RCA (with large footrope gear on the slope for example) would still be allowed and subject to normal WCGOP observer rotations.

NMFS indicated that the proposed language for Amendment 10 addresses this issue. If this issue is addressed in the final Amendment 10 rule, then this item does not need to be addressed further.

2009-10 Area Restriction Alternatives

Include the ability to implement depth-based closures for the whiting fishery as an inseason measure upon the projected attainment of one or more bycatch limits for canary and widow rockfish, or the Chinook harvest guideline.

Sector-Specific Bycatch Limits

The GMT believes that sector-specific bycatch limits may tend to decrease competition between sectors, potentially fostering the ability for each sector to manage bycatch successfully. This outcome would increase the likelihood of attaining the whiting OY. The GMT identified several issues that are related to this topic that would need to be addressed in the analysis. First, a bycatch allocation for each sector would need to be calculated. During preliminary discussions, the GMT identified two possible methods: 1) pro-rata distribution and 2) distribution based on the whiting bycatch model rates. Imposing inflexible, hard limits on each sector may inadvertently constrain one or more sectors even if the overall total bycatch across all three sectors is less than the overall three sector limit. To alleviate this possibility, sector-specific bycatch limits could be subject to adjustments or re-apportionment via a routine inseason adjustment, or sector specific bycatch could be subject to a roll-over from one sector to another if one sector completes harvesting operations and has not taken all of its bycatch. The GMT notes that sector allocations are currently being developed under FMP Amendment 21, which concerns formal allocations of some groundfish species and species complexes to limited entry trawl sectors, and the 2009-2010 exploration of sector-specific bycatch limits could build upon these analyses.

The Council decided in April 2008 to include the above options identified by the GMT for analysis and public review, with the following additional sub-options:

- Upon the attainment of the whiting allocation by a sector, allow the roll-over of unused bycatch cap amounts to the remaining non-tribal whiting sectors pro-rated to their respective initial whiting allocations.
- Upon the attainment of the whiting allocation by a sector, add the remaining unused bycatch cap amounts to the overall residual in the scorecard to be accessed by any sector, including to cover projected overages in research catches.

Seasonal Release of Shared Bycatch Limits

The GMT discussed the concept of scheduled releases of bycatch in the whiting fishery and believes that it would tend to operate similarly to sector-specific bycatch limits. This tool would operate similarly to sector-specific caps because of the seasonal timing of fishing operations of the three whiting sectors and the fact that devoting specific bycatch amounts to specific times could have an allocative effect, like sector-specific limits. Like sector-specific limits, a scheduled release could inadvertently constrain one or more whiting sectors. Therefore, rolling over unused bycatch from one season to another may provide some flexibility in using this tool. In addition, allowing seasonal release amounts to be adjusted via an inseason action could provide another source of flexibility. The current method of releasing the bycatch limit to the fishery at the start of the season tends to favor the sectors that operate in the early part of the season.

The Council decided in April 2008 to include options for seasonal releases of an overall whiting sector bycatch cap, using the following release schedules:

- Apr 1: 45%; June 15: 40%; Fall 15%,
- Apr 1: 50%; June 15: 40%; Fall 10%,
- Apr 1: 50%; June 15: 45%; Fall 5%,
- Across all sub-options analyze the following release dates for the Fall period: Sept 1; Sept 15; and Oct 1,
- Across all sub-options any unused bycatch amounts from the previous release would carry-over to the following specified season.

Changing the At-Sea Processing Restrictions in the Shoreside Whiting Fishery

The Council adopted an alternative for analysis and public review that would modify whiting regulations to allow heading, gutting and tailing of whiting in the shoreside whiting fishery for vessels that are 75 ft. in length or less. This action could provide increased economic incentives by allowing a value-added product to be landed.

Limited Entry Fixed Gear

Routine management measures such as alternative trip limits and non-trawl RCA adjustments are included in the analyses provided in section 4.5.4.3 of this EIS. The following management measures are also analyzed and discussed in section 4.5.4.3.

2009-10 Area Restriction Alternatives

Non-trawl RCA boundary adjustments north of 40°10' N latitude are contemplated in this EIS to reduce yelloweye bycatch. Analysis of impacts associated with progressively moving the entire seaward line from 100 fm to 125 fm and 150 fm have been done in previous analyses {cite 2007-08 spex EIS; PFMC 2006} and are provided again in section 4.5.4.2 of this EIS with updated WCGOP discard rates. There now exists enough WCGOP to consider finer scale northern non-trawl RCA adjustments. Analysis of impacts associated with progressively moving sections of the northern seaward non-trawl RCA north of 40°10' N latitude and south of the U.S.-Canada border from 100 fm to 125 fm and 150 fm are also provided in section 4.5.4.2 with latitudinal stratifications at the Columbia-Eureka INPFC line (43° N lat.), Cascade Head, Oregon (45.064° N lat.), and Point Chehalis, Washington (46.888°). Adjustments of the seaward non-trawl RCA boundary in the north largely affect sablefish targeting, but also affect targeting opportunities on slope rockfish, spiny dogfish, shortspine thornyhead, and Pacific halibut.

[New YRCAs for 2009-10?]

Gear Switching

Providing the opportunity for gear switching from longline to pot gears could potentially allow greater access to non-overfished stocks while reducing impacts to overfished species, especially yelloweye rockfish. WCGOP data indicates that yelloweye catch in pot fisheries is lower than catch in longline fisheries. Initial scoping indicates there might be an economic impact of switching from longline to pot gears. If a limited entry permit with a longline endorsement is allowed to use either pot or longline gear, the value of the longline-endorsed permit could increase and the value of pot-endorsed fixed gear permits could decrease. There would be an increased investment in new gear for those electing to switch gears. There may also be a cost in potentially reducing efficiency when targeting sablefish. There could also be increased gear conflicts on the fishing grounds. If the proposed gear switching is recommended by the Council, and analyzed for 2009-2010, an amendment to the Fishery Management Plan would be needed.

Mandatory Logbooks

Logbooks are not currently mandatory in the limited entry fixed gear fishery and the states vary in their logbook requirements. Oregon has a mandatory requirement, Washington has a voluntary program, and California has no requirement but did do a pilot study to investigate the feasibility of a nearshore logbook. Logbooks are considered in this analysis because of the information they provide on the timing and location of fishing effort. Logbooks information can improve catch projections and estimates of total catch, providing the ability to model impacts more precisely. Improved modeling allows consideration of more refined trip limits and RCA adjustments. Implementation of a mandatory coastwide logbook program would require coordination between NMFS and the states. The risk of not implementing the program would be no improvement in our knowledge of the fixed gear fleet. Logbooks can also improve stock assessments by providing information on CPUE and area of catch.

Directed Open Access

Routine management measures such as alternative trip limits and non-trawl RCA adjustments are included in the analyses provided in section 4.5.4.4. The following management measures are also analyzed and discussed in section 4.5.4.4.

<u>2009-10 Area Restriction Alternatives</u>

The same non-trawl RCA adjustment alternatives described above for the limited entry fixed gear sector would also apply to the directed open access sector. Adjustments of the seaward non-trawl RCA boundary in the north largely affect sablefish targeting in the daily-trip-limit fishery, but also affect targeting opportunities on slope rockfish, spiny dogfish, shortspine thornyhead, and Pacific halibut.

[New YRCAs for 2009-10?]

<u>Mandatory Logbooks</u>

The same considerations for a mandatory logbook program in the limited entry fixed gear fishery, as described in the previous section apply to the directed open access fishery

Incidental Open Access

The following management measures are analyzed and discussed in section 4.5.4.5 of this EIS.

<u>2009-10 Area Restriction Alternatives</u>

[New YRCAs for 2009-10?]

<u>Retention of Lingcod in Salmon Troll Fisheries</u>

Industry representatives requested greater retention of lingcod in 2009-10 West Coast salmon troll fisheries. Lingcod retention is not allowed by open access fishermen participating in fisheries exempt from RCA restrictions (i.e., salmon troll and pink shrimp fisheries) while fishing in the RCA. Lingcod are caught incidentally when targeting Chinook salmon, so the request was to allow retention as a ratio of Chinook caught and landed. The Council adopted the following lingcod retention options for analysis:

- Allow the retention of 1 lingcod for every 15 Chinook salmon, plus one additional lingcod, not to exceed 10 lingcod per trip, up to a maximum limit of 400 lbs/month.
- Allow the retention of 1 lingcod for every 20 Chinook salmon, plus one additional lingcod, not to exceed 10 lingcod per trip, up to a maximum limit of 400 lbs/month.

Tribal

The Washington treaty tribes proposed and the Council adopted the following 2009-10 tribal management measures for analysis and public review. The following management measures are analyzed and discussed in section 4.5.4.6 of this EIS.

Black Rockfish - The 2009 and 2010 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 2009 and 2010 tribal set asides for sablefish will be set at 10 percent of the Monterey through Vancouver area OY minus 1.6 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 2009 and 2010.

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. Those limits would be accumulated across vessels into a cumulative fleetwide harvest target for the year. 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.

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.

Lingcod - Tribal fisheries will be subject to a 250 mt harvest guideline for 2009 and 2010.

Spiny Dogfish - The Makah Tribe is proposing a directed longline fishery for spiny dogfish for 2009 and 2010. The fishery would be restricted to the Limited Entry trip limits. Increased landings of dogfish by treaty fishermen in 2009 and 2010 would be dependent on successful targeting in 2008 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 2009 and 2010

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 shortspine and longspine thornyhead, Dover sole, English sole, rex sole, arrowtooth flounder, and other flatfish. For Dover sole, thornyheads (both shortspine and longspine), 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 (< 8 inches) trawl gear. Exploration of the use of selective flatfish trawl gear will be conducted in 2008.

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

Washington Recreational

The following management measures are analyzed and discussed in section 4.5.4.7 of this EIS.

<u>2009-10 Season Alternatives</u>

Figures 2-14 to 2-16 provide alternative 2009-10 Washington recreational groundfish seasons by management area adopted for analysis and public review. These season alternatives vary from most restrictive in 2-14 to most liberal in Figure 2-16 to comply with the range of yelloweye catch sharing options in Table 2-8.

Washington Rec. Alternative 2 includes a Groundfish Fishing Area (GFA) in waters offshore from Washington in Marine Area 4 that is proposed to be open year-round to recreational fishing (Figure 2-17). This GFA is described using the following coordinates:

48°19 N lat..	125°22 W long.
48°19 N lat.;	125°18 W long.
48°16 N lat.;	125°18 W long.
48°16 N lat.;	125°22 W long.

<table>
<tr><th>Marine Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>3 & 4 (N. Coast)</td><td colspan="3">CLOSED Jan. 1 - Apr. 16</td><td>Open all depths</td><td colspan="3">Open <20 fm May 1-Aug 15 a/</td><td colspan="5">CLOSED Aug. 16 - Dec. 31</td></tr>
<tr><td>2 (S. Coast)</td><td colspan="2">Open all depths</td><td colspan="4">Open <30 fm Mar 15 - June 15 b/ c/</td><td colspan="3">Open all depths except lingcod prohibited >30 fm c/</td><td colspan="3">Open all depths</td></tr>
<tr><td>1 (Col. R.)</td><td colspan="4">Open all depths</td><td colspan="5">Open all depths d/</td><td colspan="3">Open all depths</td></tr>
<tr><td colspan="13">a/ Groundfish retention allowed >20 fm on days when Pacific halibut is open.
b/ Retention of sablefish and Pacific cod allowed seaward of 30 fm from May 1- June 15.
c/ Retention of lingcod prohibited >30 fm from March 15 - September 30.
d/ Retention of groundfish, except sablefish and Pacific cod, prohibited with Pacific halibut on board from May 1 - September 30.</td></tr>
</table>

Figure 2-14. The alternative 1 Washington recreational groundfish season by marine management area in 2009-10.

<table>
<tr><th>Marine Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>3 & 4 (N. Coast)</td><td colspan="3">Open in Offshore GFA Only Aug 16 - Apr 16</td><td>Open all depths</td><td colspan="3">Open <20 fm May 1-Aug 15 a/</td><td colspan="5">Open in Offshore GFA Only Aug 16 - Apr 16</td></tr>
<tr><td>2 (S. Coast)</td><td colspan="2">Open all depths</td><td colspan="4">Open <30 fm Mar 15 - June 15 b/ c/ d/</td><td colspan="3">Open all depths except lingcod prohibited on Fri. and Sat. >30 fm c/ d/</td><td colspan="3">Open all depths</td></tr>
<tr><td>1 (Col. R.)</td><td colspan="4">Open all depths</td><td colspan="5">Open all depths e/</td><td colspan="3">Open all depths</td></tr>
<tr><td colspan="13">a/ Groundfish retention allowed >20 fm on days when Pacific halibut is open.
b/ Retention of sablefish and Pacific cod allowed seaward of 30 fm from May 1- June 15.
c/ Retention of lingcod prohibited >30 fm on Fri. and Sat. from March 15 - September 30.
d/ Retention of lingcod prohibited south of 46°58' N lat. from March 15 - September 30.
e/ Retention of groundfish, except sablefish and Pacific cod, prohibited with Pacific halibut on board.</td></tr>
</table>

Figure 2-15. The alternative 2 Washington recreational groundfish season by marine management area in 2009-10.

<table>
<tr><th>Marine Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>3 & 4 (N. Coast)</td><td colspan="4">Open all depths</td><td colspan="5">Open <20 fm May 1-Sep 30 a/</td><td colspan="3">Open all depths</td></tr>
<tr><td>2 (S. Coast)</td><td colspan="2">Open all depths</td><td colspan="4">Open <30 fm Mar 15 - June 15 b/</td><td colspan="3">Open all depths except lingcod prohibited on Fri. and Sat. >30 fm c/</td><td colspan="3">Open all depths</td></tr>
<tr><td>1 (Col. R.)</td><td colspan="4">Open all depths</td><td colspan="5">Open all depths d/</td><td colspan="3">Open all depths</td></tr>
<tr><td colspan="13">a/ Groundfish retention allowed >20 fm on days when Pacific halibut is open.
b/ Retention of sablefish and Pacific cod allowed seaward of 30 fm from May 1- June 15.
c/ Retention of lingcod prohibited >30 fm on Fri. and Sat. from June 16 - September 30.
d/ Retention of groundfish, except sablefish and Pacific cod, prohibited with Pacific halibut on board.</td></tr>
</table>

Figure 2-16. The alternative 3 Washington recreational groundfish season by marine management area in 2009-10.

[Insert GFA figure here]

Figure 2-17. A Groundfish Fishing Area (GFA) in waters offshore from Washington in Marine Area 4 that is proposed to be open year-round to recreational fishing in 2009-10.

2009-10 Bag and Size Limit Alternatives

No alternative bag or size limits are considered other than those described for the Washington recreational fishery under the No Action Alternative.

2009-10 Area Restriction Alternatives

The YRCAs described for the Washington recreational fishery under the No Action Alternative would apply for 2009-10 fisheries.

In Washington Marine Area 2, the following area restriction options are proposed if needed in 2009-10 (Figure 2-18):

Option 1: Prohibit the retention of rockfish and lingcod seaward of a line approximating 25 fathoms from March 15-June 15, using the following coordinates:

47°31.70 N lat. 124°34.660 W long.
47°25.67 N lat. 124°32.775 W long.
47°12.82 N lat. 124°26.000 W long.
46°52.94 N lat. 124°18.940 W long.
46°44.18 N lat. 124°14.890 W long.
46°38.17 N lat. 124°13.700 W long.

Option 2: In combination with any of the options and season alternatives listed above for Marine Area 2, prohibit fishing for or possession of lingcod in the following areas:

46°57.00 N lat. 124°30.00 W long.
47°00.00 N lat. 124°30.00 W long.
47°00.00 N lat. 124°33.50 W long.
46°57.00 N lat. 124°33.50 W long.

46°55.50 N lat. 124°24.00 W long.
46°56.50 N lat. 124°00.00 W long.
46°56.50 N lat. 124°25.70 W long.
46°55.50 N lat. 124°25.70 W long.

46°56.70 N lat. 124°34.00 W long.
46°57.70 N lat. 124°34.00 W long.
46°57.70 N lat. 124°35.50 W long.
46°56.70 N lat. 124°35.50 W long.

47°07.70 N lat. 124°30.00 W long.
47°07.70 N lat. 124°27.50 W long.
47°06.50 N lat. 124°27.50 W long.
47°06.50 N lat. 124°30.00 W long.

46°52.50 N lat. 124°21.70 W long.
46°52.50 N lat. 124°20.30 W long.
46°51.60 N lat. 124°20.30 W long.
46°51.60 N lat. 124°21.70 W long.

46°52.50 N lat. 124°26.60 W long.
46°52.50 N lat. 124°25.30 W long.
46°51.60 N lat. 124°25.30 W long.
46°51.60 N lat. 124°26.60 W long.

Option 3: In combination with any of the options listed above for Marine Area 2, prohibit fishing for or possession of bottomfish, lingcod and halibut in the following areas:

46°42.50 N lat. 124°42.00 W long.
46°42.50 N lat. 124°34.00 W long.
46°37.50 N lat. 124°34.00 W long.
46°37.50 N lat. 124°42.00 W long.

46°54.30 N lat. 124°53.40 W long.
46°54.30 N lat. 124°51.00 W long.
46°53.30 N lat. 124°51.00 W long.
46°53.30 N lat. 124°53.40 W long.

46°53.50 N lat. 124°47.50 W long.
46°53.50 N lat. 124°45.50 W long.
46°52.50 N lat. 124°45.50 W long.
46°52.50 N lat. 124°47.50 W long.
47°05.50 N lat. 124°48.50 W long.
47°05.50 N lat. 124°45.50 W long.
47°03.50 N lat. 124°45.50 W long.
47°03.50 N lat. 124°48.50 W long.

47°10.00 N lat. 124°36.20 W long.
47°10.00 N lat. 124°33.20 W long.
47°08.00 N lat. 124°33.20 W long.
47°08.00 N lat. 124°36.20 W long.

South Coast Proposed Management Areas

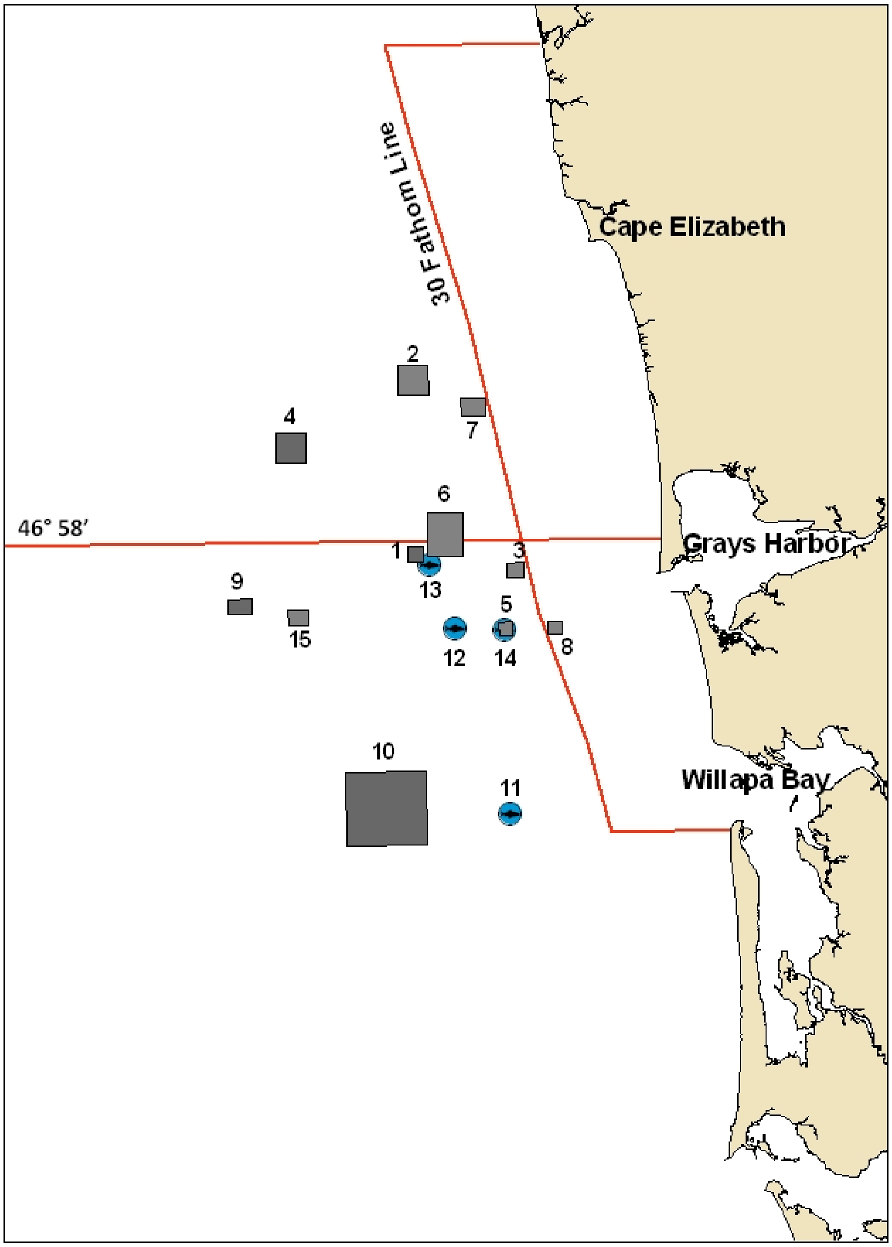

Figure 2-18. Area restrictions proposed for the 2009-10 Washington recreational fisheries on the south coast in Marine Area 2 if needed.

Mandatory Logbooks in Recreational Charter Fisheries

Consideration of a logbook program is mandated under the re-authorized Magnuson-Stevens Act, though implementation is not required. Logbooks could provide data needed to monitor catch inseason and assess stocks of recreationally important species, which may help in ensuring rebuilding plans are met. Logbooks could provide effort estimates for this fishing mode with greater accuracy than current estimation methods, although depending on the program infrastructure, the information may not be as timely as needed for inseason management. Logbooks may provide additional information that is not currently being collected through the state recreational sampling and survey programs (e.g., location data and CPUE). This data may help identify areas to be avoided to protect overfished species and may also provide valuable information for stock assessments. There may be other methods for collecting additional information from this harvest sector that are more accurate (e.g., observers). A mandatory coastwide logbook program, that meets state and federal requirements, would require coordination between NMFS and the states.

Oregon Recreational

Oregon has a responsive port based monitoring program through their Ocean Recreational Boat Survey (ORBS) and regulatory processes in place to track harvest and take actions inseason if necessary. The following are suggested management measures that could be implemented inseason if the 2009 (or 2010) fishery does not proceed as expected.

Inseason management tools include changes to size limits, bag limits (including non retention), seasons, closing days per week, depth and area closures, and gear restrictions. The fishery is managed to not exceed any specified harvest guidelines on overfished species.

Depth management will be the main inseason tool for controlling yelloweye rockfish and canary rockfish catch. Offshore closures may be implemented inseason at 40, 30, 25, or 20 fathoms as the presence of these two species is reduced nearshore and release survival increases at shallower depths. Other options include latitudinal area closures based on established management lines for salmon and Pacific halibut fisheries. Duration of off shore closures and area affected may be adjusted dependant on the allowable catch limit of Pacific halibut (increase or decrease from the 2008 level). Additionally, the duration and size of offshore closure periods may be adjusted if the total season length is modified due to inseason management actions addressing harvest guidelines of non-overfished groundfish.

Although retention of canary rockfish and yelloweye rockfish in recreational fisheries is currently prohibited, bycatch mortality of released fish is large enough to constrain the fishery for other groundfish species. The large offshore RCA closure is an example of how these recreational fisheries are affected by bycatch of these overfished species. To help alleviate this constraint without increasing bycatch mortality, the large offshore RCA closures may be modified inseason to close areas of known canary rockfish and yelloweye rockfish concentrations OR open areas known to have no or low concentrations of canary rockfish and yelloweye rockfish. Currently, there is one Yelloweye Rockfish Conservation Area (YRCA) located off Newport, Oregon, referred to as the Stonewall Bank YRCA (coordinates below). Work is currently being conducted on identification of additional areas to be included for analysis. Specific area proposals may be available at the June Council meeting, or included in the final EIS.

The Stonewall Bank YRCA was implemented through the 2007-08 biennial management process. Multiple alternatives for size of the YRCA were analyzed at that time, and allows for expansion of the area inseason. The same alternatives are proposed for use in 2009-10 fisheries. The location of the status quo YRCA is:

Similarly, other means to reduce bycatch mortality, especially of overfished species, may include gear restrictions and/or release techniques. For example, ODFW is presently studying the effects of sub-surface release on the survival of rockfish. If successful techniques are developed and accepted, their use may alleviate the current constraints from bycatch mortality on recreational fisheries. Other examples could include modifications of terminal gear, perhaps requiring long leaders or weight restrictions, to avoid or reduce capture of species with harvest constraints.

Bag limit changes may be implemented to adjust expected catch of non-overfished species to achieve season duration goals. Non-retention and size restrictions are inseason tools to reduce catch for species such as cabezon and greenling, both under state harvest guidelines, as release survival is very high. These tools may also be used to reduce harvest on other nearshore species due to improved survival of release in shallow depths. In addition to inseason options, total closure of the groundfish recreational fishery may be implemented to stay within harvest guidelines.

Directed yellowtail rockfish and/or flatfish fisheries may be implemented inseason in the event of a closure or management action affecting the nearshore recreational groundfish fishery due to attainment of species harvest guidelines or state harvest caps, as were conducted in 2004. Fisheries will be monitored to ensure that impacts to yelloweye and canary rockfish are not in excess of the harvest guidelines.

The following management measures are analyzed and discussed in section 4.5.4.8 of this EIS.

<u>2009-10 Season Alternatives</u>

Figures 2-19 to 2-24 provide 2009-10 Oregon recreational groundfish season alternatives adopted for analysis and public review. These season alternatives vary from most restrictive in 2-19 to most liberal in Figure 2-24 to comply with the range of yelloweye catch sharing options in Table 2-8. Figure 2-22 is also the status quo 2007-08 Oregon recreational groundfish season.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
CLOSED				Open <25 fm					CLOSED		

Figure 2-19. The alternative 1 Oregon recreational groundfish season in 2009-10.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Open <30 fm											

Figure 2-20. The alternative 2 Oregon recreational groundfish season in 2009-10.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Open <40 fm											

Figure 2-21. The alternative 3 Oregon recreational groundfish season in 2009-10.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Open all depths			Open <40 fm						Open all depths		

Figure 2-22. The alternative 4 Oregon recreational groundfish season in 2009-10. This is also the status quo 2007-08 Oregon recreational groundfish season.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Open all depths					Open <40 fm June 20 - Aug 31			Open all depths			

Figure 2-23. The alternative 5 Oregon recreational groundfish season in 2009-10.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Open all depths					Open <40 fm				Open all depths		

Figure 2-24. The alternative 6 Oregon recreational groundfish season in 2009-10.

2009-10 Bag and Size Limit Alternatives

ODFW is considering an increase in the Oregon recreational marine daily bag limit from 8 marine fish in aggregate to 10 marine fish in aggregate in 2009-10. Other than this alternative, all other bag and size limits are the same as specified in 2007-08 and described under the No Action Alternative.

2009-10 Area Restriction Alternatives

Two options for extending the status quo Stonewall Bank YRCA for 2009-10 recreational fisheries are shown in Figure 2-11 and are defined by the following coordinates:

Stonewall Bank Option 2 (largest area):

44°41.7594’ N lat. 124°30.018’ W long.
44°41.7348’ N lat. 124°21.603’ W long.
44°25.2456’ N lat. 124°16.944’ W long.
44°25.2942’ N lat. 124°30.1404’ W long.
44°41.7594’ N lat. 124°30.018’ W long.

Stonewall Bank Option 3 (medium area):

44°38.544’ N lat. 124°27.4122’ W long.
44°38.544’ N lat. 124°23.8554’ W long.
44°27.132’ N lat. 124°21.501’ W long.
44°27.132’ N lat. 124°26.8944’ W long.
44°31.302’ N lat. 124°28.3476’ W long.

Mandatory Logbooks in Recreational Charter Fisheries

Mandatory logbooks are contemplated for all West Coast marine recreational charter fisheries in this action. The discussion of this issue in the Washington Recreational section applies to Oregon recreational charter fisheries as well.

California Recreational

CDFG is proposing to add a new marine management area in 2009-10 by dividing the North-Central management area north and south of Pt. Arena. The following management measures are analyzed and discussed in section 4.5.4.9 of this EIS.

<u>2009-10 Season Alternatives</u>

Figures 2-25 to 2-30 provide alternative 2009-10 California recreational groundfish seasons by management area, including two new areas (North-Central North of Pt. Arena and North-Central South of Pt. Arena), adopted for analysis and public review. These season alternatives vary from most restrictive in 2-25 to most liberal in Figure 2-30 to comply with the range of yelloweye catch sharing options in Table 2-8.

All divers and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish and other Federal groundfish. (Note: use of boats is permitted while diving for rockfish or other closed, but not prohibited, species during closed periods, provided no hook and line gear is on board or in possession). Exemptions to season restrictions for the retention and possession of leopard sharks in specified bays and estuaries by boat-based anglers still apply in 2009-2010. The retention and possession of sanddabs and "other flatfishes" are exempt from season and depth restrictions.

<table>
<tr><th>Management Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North</td><td colspan="5">CLOSED</td><td colspan="2">Open <20 fm</td><td colspan="5">CLOSED</td></tr>
<tr><td>North-Central N. of Pt. Arena</td><td colspan="5">CLOSED</td><td colspan="2">Open <20 fm June 1-July 15</td><td colspan="5">CLOSED</td></tr>
<tr><td>North-Central S. of Pt. Arena</td><td colspan="5">CLOSED</td><td colspan="6">Open <30 fm</td><td>CLOSED</td></tr>
<tr><td>Monterey South-Central</td><td colspan="4">CLOSED</td><td colspan="7">Open <40 fm</td><td>CLOSED</td></tr>
<tr><td>Morro Bay South-Central</td><td colspan="4">CLOSED</td><td colspan="7">Open <40 fm</td><td>CLOSED</td></tr>
<tr><td>South</td><td colspan="2">CLOSED</td><td colspan="10">Open <60 fm</td></tr>
</table>

Figure 2-25. The alternative 1 California recreational groundfish season by marine management area in 2009-10.

<table>
<tr><th>Management Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North</td><td colspan="5">CLOSED</td><td colspan="2">Open <20 fm</td><td colspan="5">CLOSED</td></tr>
<tr><td>North-Central N. of Pt. Arena</td><td colspan="5">CLOSED</td><td colspan="2">Open <20 fm</td><td colspan="5">CLOSED</td></tr>
<tr><td>North-Central S. of Pt. Arena</td><td colspan="5">CLOSED</td><td colspan="4">Open <30 fm</td><td colspan="3">CLOSED</td></tr>
<tr><td>Monterey South-Central</td><td colspan="4">CLOSED</td><td colspan="7">Open <40 fm</td><td>CLOSED</td></tr>
<tr><td>Morro Bay South-Central</td><td colspan="4">CLOSED</td><td colspan="7">Open <40 fm</td><td>CLOSED</td></tr>
<tr><td>South</td><td colspan="2">CLOSED</td><td colspan="10">Open <60 fm</td></tr>
</table>

Figure 2-26. The alternative 2 California recreational groundfish season by marine management area in 2009-10.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED					Open <20 fm June 1 - Aug 15		CLOSED				
North-Central N. of Pt. Arena	CLOSED					Open <20 fm June 1 - Aug 15		CLOSED				
North-Central S. of Pt. Arena	CLOSED					Open <30 fm						CLOSED
Monterey South-Central	CLOSED				Open <40 fm							CLOSED
Morro Bay South-Central	CLOSED				Open <40 fm							CLOSED
South	CLOSED		Open <60 fm									

Figure 2-27. The alternative 3 California recreational groundfish season by marine management area in 2009-10.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED				Open <20 fm				CLOSED			
North-Central N. of Pt. Arena	CLOSED					Open <20 fm June 1 - Aug 15		CLOSED				
North-Central S. of Pt. Arena	CLOSED					Open <30 fm						CLOSED
Monterey South-Central	CLOSED				Open <40 fm							CLOSED
Morro Bay South-Central	CLOSED				Open <40 fm							CLOSED
South	CLOSED		Open <60 fm									

Figure 2-28. The alternative 4 California recreational groundfish season by marine management area in 2009-10.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED					Open <20 fm			CLOSED			
North-Central N. of Pt. Arena	CLOSED					Open <20 fm			CLOSED			
North-Central S. of Pt. Arena	CLOSED					Open <30 fm						CLOSED
Monterey South-Central	CLOSED				Open <40 fm							CLOSED
Morro Bay South-Central	CLOSED				Open <40 fm							CLOSED
South	CLOSED		Open <60 fm									

Figure 2-29. The alternative 5 California recreational groundfish season by marine management area in 2009-10.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED				Open <20 fm					CLOSED		
North-Central N. of Pt. Arena	CLOSED					Open <20 fm				CLOSED		
North-Central S. of Pt. Arena	CLOSED					Open <30 fm						CLOSED
Monterey South-Central	CLOSED				Open <40 fm							CLOSED
Morro Bay South-Central	CLOSED				Open <40 fm							CLOSED
South	CLOSED		Open <60 fm									

Figure 2-30. The alternative 6 California recreational groundfish season by marine management area in 2009-10.

2009-10 Bag Limits, Size Limit, and Other Management Measure Alternatives

The following bag limits, size limits, and other management measure alternatives are considered for the 2009-10 California recreational groundfish fishery:

- a 6 fish Rockfish Cabezon and Greenling RCG bag limit in the North and North-Central North of Pt. Arena Management Areas and 10 fish bag limit in the remainder of the state with a 1 fish sublimit for cabezon, 2 fish sublimit for greenlings statewide.
- increase the bag limit for cabezon from 1 to 2 fish in some management areas.
- increase the bag limit for bocaccio from 1 to 2 fish in some management areas south of 40°10' N latitude.
- increase the bag limit for kelp greenling from 1 to 2 fish in some management areas.
- eliminate gear restrictions for sanddabs and other flatfishes.
- include petrale sole in the group of sanddabs and other flatfish allowed during season closures.
- reduce the size limit for lingcod north of Pt. Arena to 22 inches.
- modify existing bag limits and bag compositions to better allow for take of unconstrained species and improve avoidance of constraining species (i.e., adjustments to existing RCG complex regulations). *[What are the details of this proposal? Described in first bullet?]*

2009-10 Area Restriction Alternatives

Five YRCAs were previously proposed in state waters for 2008. CDFG staff estimated about 70% of the 2007 yelloweye catch in the California recreational fishery occurred in these YRCAs. The following are descriptions of the five proposed YRCAs that are contained entirely within state waters and were previously considered for 2008 inseason management purposes. Public comments were received on these proposed areas at the 2008 and 2009-2010 public meetings regarding the proposed implementation of the YRCAs proposed below. Subsequently, the Department has analyzed alternatives including four additional areas that include both federal and state waters.

- Point St. George YRCA (Del Norte County): Defined as the area within state waters between a line extending due west through the NOAA buoy off of Point St. George at 41° 51’ 00” N latitude and a line extending due west from Castle Rock at 41° 45’ 40” N latitude; from shore to the state/federal water boundary.

- Punta Gorda YRCA (Humboldt County): Defined as the area within state waters between a line extending due West from the Punta Gorda Lighthouse at 40° 15’ 15” N latitude and a line extending due West from Reynolds Creek mouth at 40° 12’ 00” N latitude; from shore to the state/federal water boundary.

- Point Delgada YRCA (Humboldt County): Defined as the area within state waters south of a line extending due west from Yellow Bluff at 40° 02’ 35” N latitude and west of a line extending due south from Dead Man's Gulch at 124° 03’ 26” W longitude, to the state/federal water boundary.

- Bells Point YRCA (Mendocino County): The area within state waters between a line extending due west from Switzer Rock 39° 38’ 50” N latitude and a line extending due west from Kibesillah Rock at 39° 34’ 08” N latitude; from shore to the state/federal water boundary.

- Point Cabrillo YRCA (Mendocino County): The area within state waters between a line extending due west from Hare Creek 39° 25’ 00” N latitude and a line extending due west from Point Cabrillo 39° 21’ 00” N latitude; from shore to the state/federal water boundary.

The CDFG is proposing alternate YRCAs in state and Federal waters for possible use in the 2009-2010 season (Figures 2-31 to 2-33). The savings that would result from implementation of these areas are still being analyzed. These areas may be refined by public input and the results of the catch savings analysis.

Mandatory Logbooks in Recreational Charter Fisheries

Mandatory logbooks are contemplated for all West Coast marine recreational charter fisheries in this action. CDFG already has a mandatory logbook program for their CPFV fleet. However, it is unclear whether the new Magnuson-Stevens Act mandate for charter logbooks or any contemplated action for 2009-10 West Coast fisheries may influence any modifications to the state-mandated charter logbook program. The discussion of this issue in the Washington Recreational section applies to California recreational charter fisheries as well.

Point St. George

41˚ 51.00' N. lat.; 124˚ 23.75' W. long.
41˚ 51.00' N. lat.; 124˚ 20.75' W. long.
41˚ 48.00' N. lat.; 124˚ 20.75' W. long.
41˚ 48.00' N. lat.; 124˚ 23.75' W. long.

South Reef

41˚ 42.20' N. lat.; 124˚ 16.00' W. long.
41˚ 42.20' N. lat.; 124˚ 13.80' W. long.
41˚ 40.50' N. lat.; 124˚ 13.80' W. long.
41˚ 40.50' N. lat.; 124˚ 16.00' W. long.

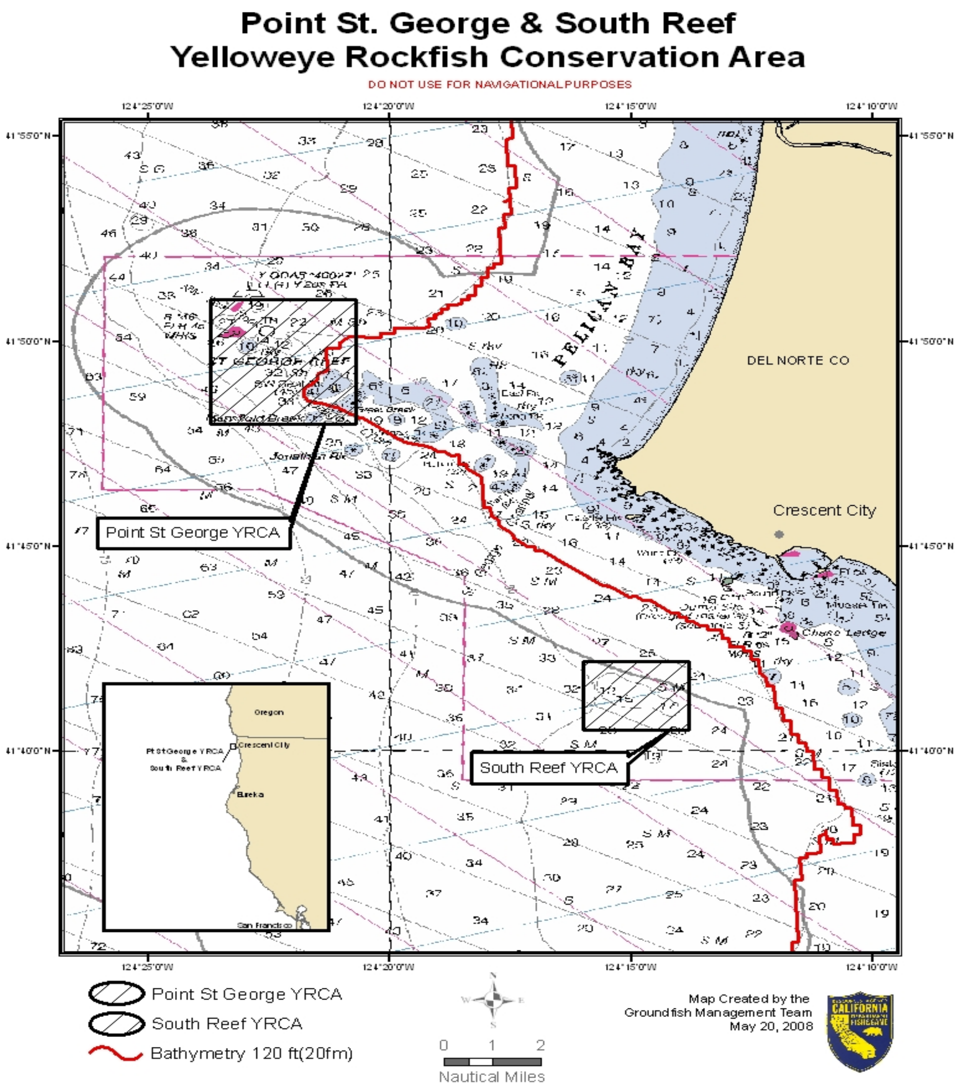

Figure 2-31.   The proposed Pt. George and South Reef Yelloweye Rockfish Conservations Areas proposed by CDFG for 2009-10.

Reading Rock

41˚ 21.50' N. lat.; 124˚ 12.00' W. long.
41˚ 21.50' N. lat.; 124˚ 10.00' W. long.
41˚ 20.00' N. lat.; 124˚ 10.00' W. long.
41˚ 20.00' N. lat.; 124˚ 12.00' W. long.

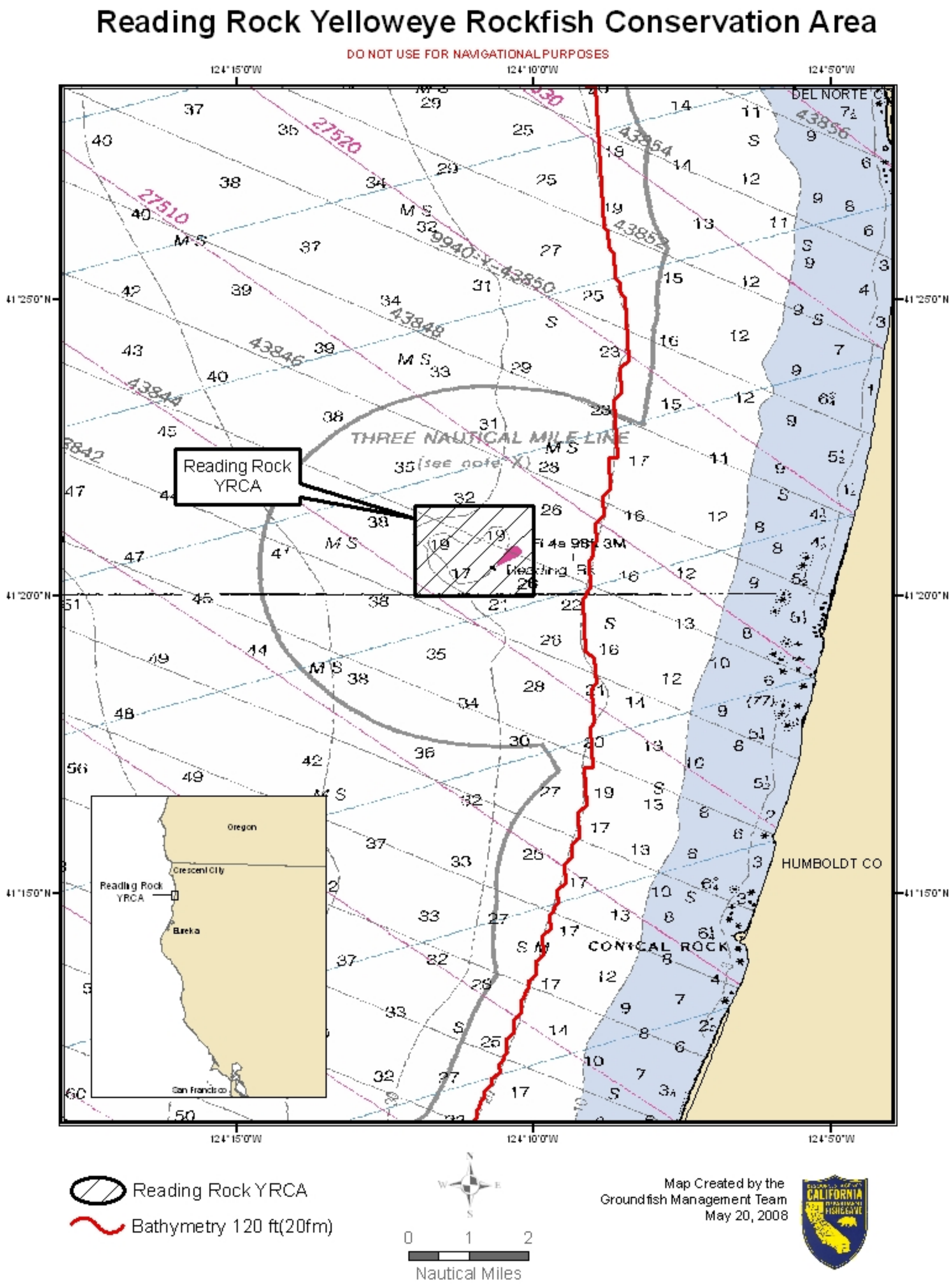

Figure 2-32. The proposed Reading Rock Yelloweye Rockfish Conservations Area proposed by CDFG for 2009-10.

Point Delgada (north)
39˚ 59.00' N. lat.; 124˚ 5.00' W. long.
39˚ 59.00' N. lat.; 124˚ 3.00' W. long.
39˚ 57.00' N. lat.; 124˚ 3.00' W. long.
39˚ 57.00' N. lat.; 124˚ 5.00' W. long.

Point Delgada (south)
39˚ 57.00' N. lat.; 124˚ 5.00' W. long.
39˚ 57.00' N. lat.; 124˚ 2.00' W. long.
39˚ 54.00' N. lat.; 124˚ 2.00' W. long.
39˚ 54.00' N. lat.; 124˚ 5.00' W. long.

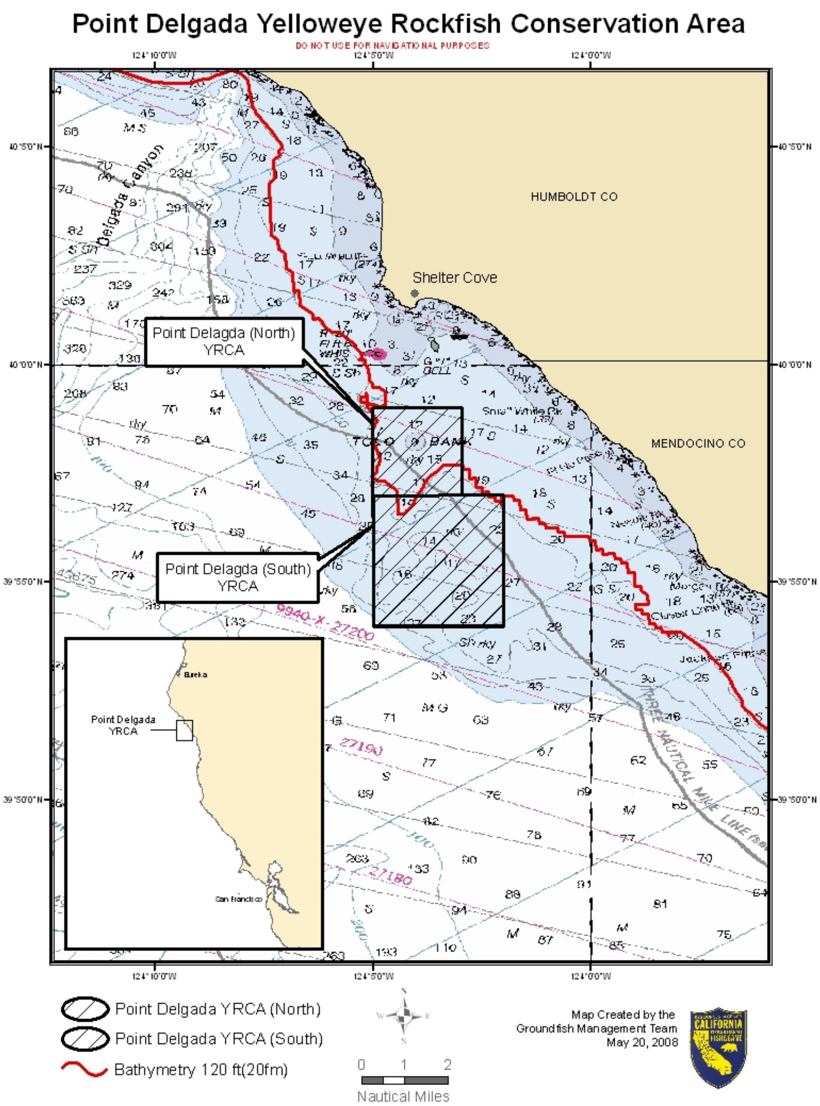

Figure 2-32. The proposed Point Delgada (north and south) Yelloweye Rockfish Conservations Areas proposed by CDFG for 2009-10.

2.2.5 Description of General Management Measures Not Specific to Sectors

2.2.5.1 *Mandatory Sorting of Skate Species*

The requirement to sort skates will provide more species-specific catch data necessary for stock assessment. This information assists in the determination of appropriate harvest specifications.

Three species of skate are listed in the FMP (big skate, California skate, and longnose skate), but no requirement exists for sorting these species in commercial fisheries. Additionally, another five skate species are encountered regularly on the shelf and slope. These skates can be visually identified to a species level. Not implementing a requirement to sort skates may force precautionary management measures necessary to protect these species, which have sensitive life histories (i.e., relatively slow growth, late maturation, and low fecundity). Skate species compositions necessary for stock assessments would not be collected without this requirement.

2.2.5.2 *Spatial Analysis of Potential Rockfish Conservation Areas (RCAs) and Groundfish Fishing Areas (GFAs)*

Finer scale spatial management of West Coast fisheries involving RCA boundary adjustments or opening Groundfish Fishing Areas (GFAs) in areas now closed meets the Magnuson-Stevens Act objectives of providing economic benefits to the nation through more robust and selective fisheries, while minimizing bycatch. Finer spatial scales of trip limits and other management measures may also be effective in reducing overfished species bycatch. Finer scale management measures may be critical to meeting the yelloweye rockfish catch reduction required by the status quo harvest rate ramp-down strategy over the next three years, without having as adverse an economic effect on West Coast fishing communities. If such management measures are not pursued, the dampening effect of the yelloweye ramp-down strategy could risk the economic stability of West Coast fishing communities dependent on stocks with yelloweye rockfish bycatch associations. The GMT notes that finer scale spatial management may provide enforcement concerns.

[The GMT is anticipating data and analysis from the NWFSC beyond what is included in this preliminary DEIS that may be helpful in pursuing finer scale area management strategies. These data and analyses will hopefully be available in one or more supplemental attachments to the June 2008 briefing book.]

2.2.6 Description of the Preferred Alternative

This section to be completed after the June 2008 Council meeting.

2.2.7 Alternative Management Measures Considered, But Eliminated From Detailed Study

This section to be completed after the June 2008 Council meeting.

2.3 Summary of Effects of the Alternatives

This section to be completed after the June 2008 Council meeting.

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CHAPTER 4 AFFECTED SPECIES

4.1 Species Description and Status

A description of the affected species and their current status from assessments and other information are available in the Council's Stock Assessment and Fishery Evaluation (SAFE) document. Volume 1 of the 2008 SAFE document is available by request to the Council office or online at www.pcouncil.org.

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 BMSY. 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.

4.2.1 Catch Monitoring Uncertainty

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 exvessel 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.

4.2.2 Stock Assessment Uncertainty

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). The results from these surveys are typically the key inputs to the stock assessments for West Coast groundfish stock assessments. 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 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 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.

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 percent 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.

4.2.3 Stock Depletion

Based on the most recent round of assessments, each depleted species is estimated to be at a different level of spawning stock biomass depletion relative to its unfished spawning stock biomass. The relative level of depletion, combined with other biological characteristics of the stock, influences the sensitivity of a stock's rebuilding time to changes in OYs. The lower the relative depletion of a stock's spawning biomass, the more risk there is in deciding higher OYs. Therefore, stocks with very low levels of depletion; such as canary rockfish, cowcod, and yelloweye rockfish; are considered to have a higher sensitivity to changes in OY and higher OYs for these species are inherently more risky.

4.2.4 Rebuilding Probability

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 $T_{F=0}$, where all 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.

4.2.5 Extended Duration of Rebuilding

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 management measure alternatives 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 2005 and 2006 West Coast groundfish fisheries (Tables 4-1 and 4-2) and "near final" 2007 total catches (Table 4-3). The reason 2007 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 fisheries in prior years. 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 2007 catch estimates will be available by the end of 2008, which is too late to be incorporated in the final EIS.

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

4.3.1 Depleted Groundfish Species

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 level of spawning stock biomass depletion, 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

<u>Harvest Limits (Harvest Guidelines or Quotas)</u>

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 depleted 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.

<u>Permits, Licenses, and Endorsements</u>

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.

Table 4-1. Estimated total mortality (mt) of groundfish species and species complexes on the West Coast in 2005.

[insert 2005 catch table here]

Table 4-2. Estimated total mortality (mt) of groundfish species and species complexes on the West Coast in 2006.

[insert 2006 catch table here]

Table 4-3. Estimated total mortality (mt) of groundfish species and species complexes on the West Coast in 2007.

[insert 2007 catch table here]

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 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 CCAs 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 depleted 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 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 percent of the active CPFV fleet each week to determine the number of trips taken and the anglers carried on each trip. This 10 percent 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 depleted 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 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.

4.3.1.1 *Impacts of Optimum Yield Alternatives*

The direct impacts of 2009-10 OY alternatives on each of the depleted species are described here. First, rebuilding strategies specific to each overfished species are described. This is followed by a discussion of rebuilding progress to date. Rebuilding progress is depicted graphically by charting the time series of spawning stock biomass of each depleted species from the 2007 assessments. Finally, an evaluation of each OY alternative against the criteria described in section 4.2 is provided as a guide in the 2009-10 decision on harvest specifications and potential rebuilding plan revisions.

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

Rebuilding Strategies for Bocaccio

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 9.2 percent of the 2007-08 OY), bocaccio total mortality has been well below the specified OY (Tables 4-1, 4-2 and 4-3). 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; although, to better manage yelloweye rockfish impacts, CDFG is recommending the addition of a sixth management area for 2009-10. Different closed seasons have been applied, and modified inseason, primarily to limit canary rockfish catches, the most constraining of the depleted 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 for the limited entry trawl sector is 150 fm in 2007-08, and the shoreward boundary varies between 75 fm and 100 fm, depending on sector and period. Around offshore islands south of 34°27' N latitude the inner boundary is the 60 fm management line in 2007-08. 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 CCAs 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.

<u>Rebuilding Progress of Bocaccio</u>

Bocaccio have shown significant rebuilding progress since being declared overfished in 1999 (Figure 4-1). Current depletion is estimated to be 12.7% of initial, unfished biomass, which is up from a minimum depletion rate of 5.9% in 1997.

Although the rebuilding OY was exceeded during the first three years of rebuilding, total mortality during the subsequent five years (including the 2007 projection in Table 4-3) has fallen far below the respective rebuilding OYs. For the eight years of rebuilding, the cumulative total mortality has fallen 40% below the cumulative OY, indicating excellent management performance overall.

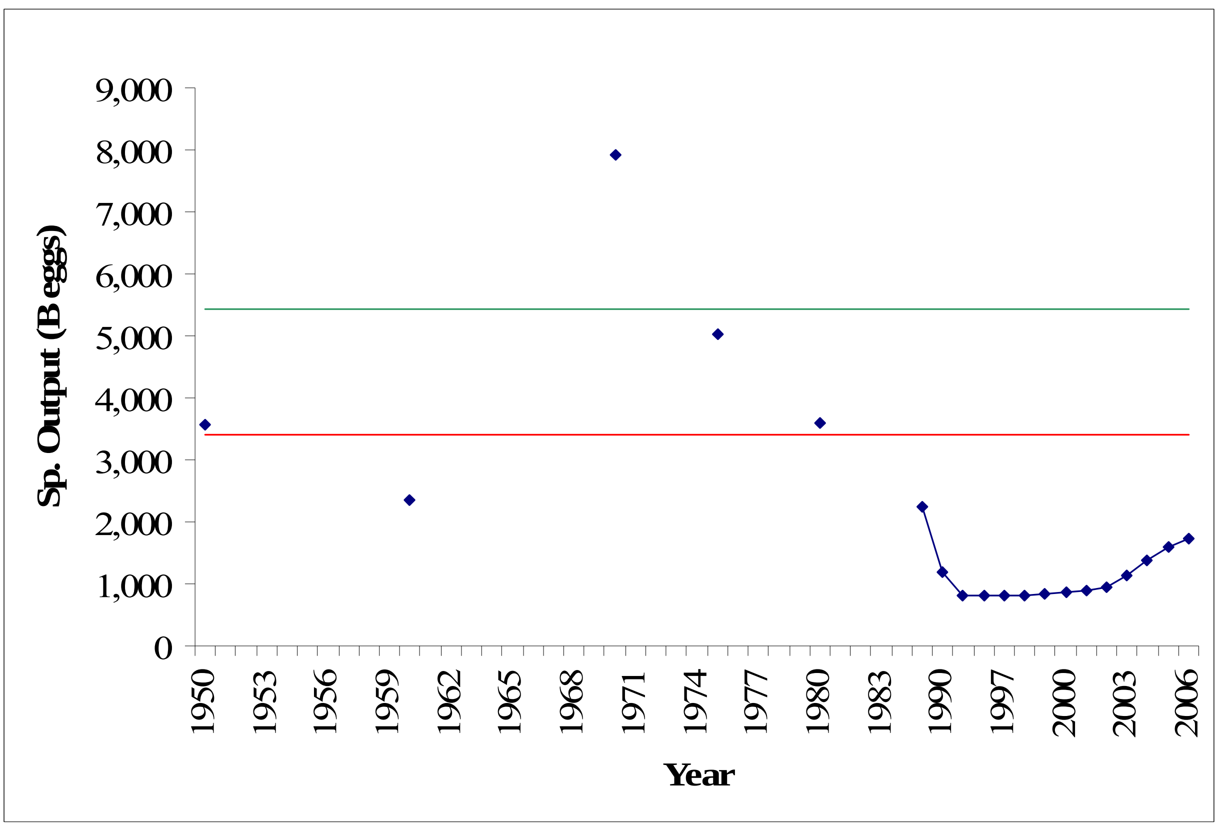


Figure 4-1. Time series of bocaccio spawning stock size relative to the FMP biomass thresholds for depletion ($B_{25\%}$) and B_{MSY} ($B_{40\%}$).

Evaluation of 2009-2010 Bocaccio OY Alternatives

Table 4-4 shows the results of the evaluation of alternative bocaccio OYs analyzed for 2009-10 using the criteria described in Section 4.2. The bocaccio OY evaluation has a mixed score using these criteria. Relatively low scores are noted using the catch monitoring uncertainty and stock depletion criteria, while relatively higher scores are assigned using the assessment uncertainty, rebuilding probability, and extended duration of rebuilding criteria.

Catch monitoring uncertainty is relatively high given the fact that 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 4-1, 4-2 and 4-3). All the recent recreational catch is estimated using the new CRFS program, which has been in existence since 2004. Prior to 2004, all recreational catch was estimated using the MRFSS program, a survey methodology designed to understand long-term national trends in marine recreational catch and participation. MRFSS was never designed to produce inseason catch and effort estimates with the precision needed to manage to low OYs or harvest guidelines, such as those specified for rebuilding bocaccio.

While California recreational catch time series are important fishery-dependent indices in the bocaccio stock assessment, the MacCall (2008a) assessment is considered relatively certain given generally good data quality and consistency. Recruitment uncertainty was a major driver in significant changes in our understanding of bocaccio status in recent assessments (see discussion below), but many of the primary assessment data issues have been resolved leading to more certainty in assessment and associated rebuilding analysis results.

The bocaccio spawning output at the start of 2007, in terms of billions of eggs produced, is estimated to be at 12.7 percent of that for the unfished stock at equilibrium. This level of stock depletion is relatively low for the Amendment 16-4 species, which infers higher OYs for this stock may be relatively more risky.

Bocaccio rebuilding schedules across the analyzed OY alternatives range from 0-3 years relative to the shortest predicted time to rebuild the stock of 2021. Rebuilding probabilities range from 88.8% for the highest OY alternative (OY Alt. 3; 288 mt in 2009 and 302 mt in 2010) to 100% for the zero-harvest alternative. The preliminary preferred OY Alternative (288 mt in 2009 and 2010) has a rebuilding probability of just over 88.8% since the 2010 OY is lower than that for OY Alternative 3.

Rebuilding is extended by two years from the shortest possible time ($T_{F=0}$) under the harvest rates used to determine the No Action Alternative and OY Alternative 2 to three years under the preliminary preferred OY Alternative and OY Alternative 3.

Table 4-4. Evaluation of alternative 2009-10 bocaccio OYs relative to the criteria described in Section 4.2.

Evaluation Criteria	OY (mt)					
	Biennial OYs	**No Action OY Alt.**	**OY Alt. 1**	**OY Alt. 2**	**Prelim. Pref. OY Alt.**	**OY Alt. 3**
	Yr. 1	218	0	218	288	288
	Yr. 2	218	0	227	288	302
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.					
Stock depletion	12.7%					
Rebuilding Probability (P_{MAX})		>91.5%	100.0%	91.5%	>88.8%	88.8%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)		2	0	2	3	3

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.

Canary Rockfish

<u>Rebuilding Strategies for Canary Rockfish</u>

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 has tended 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 three of the last eight years. The canary rockfish cumulative OY over the period 2000-2007 has been exceeded by 14%. This overage was due primarily to an excess harvest of 40 mt in 2001, when constraints on the groundfish fishery were first being imposed. 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, 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. 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 EFPs 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 they can occur in the 27-460 fm depth range (although they infrequently occur deeper than 250 fm). 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.

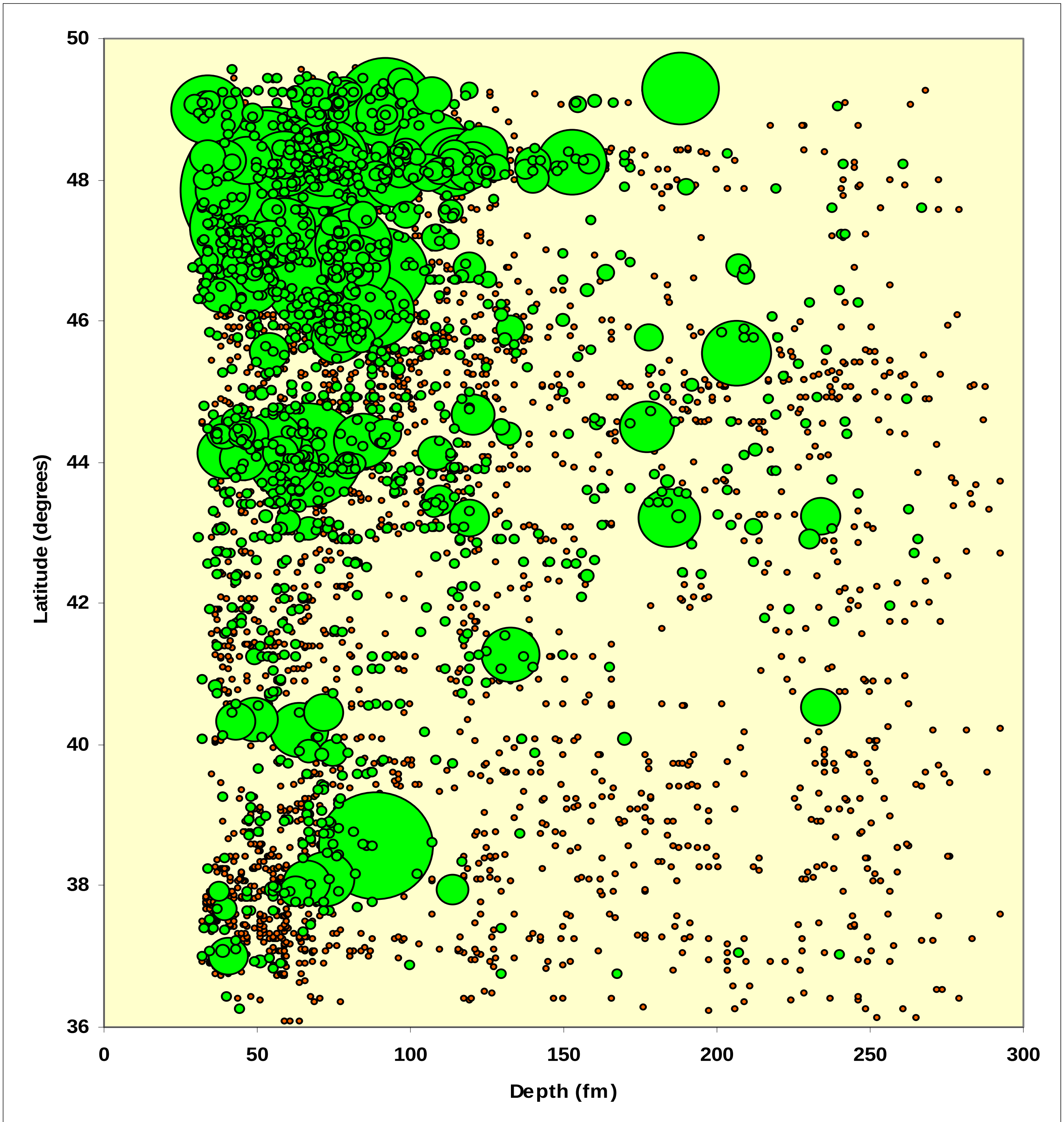


Figure 4-2. Catch per tow of canary rockfish in the NMFS triennial bottom trawl survey by latitude and depth (shaded circles are positive tows with their size proportional to CPUE, empty circles are negative tows).

Rebuilding Progress of Canary Rockfish

Canary rockfish have shown significant rebuilding progress since being declared overfished in 2000 (Figure 2-CanReb). Spawning stock biomass has gone from a minimum depletion rate of 12.9% of unfished biomass in 1994 to 32.4% in 2007 {Stewart 2008a}.

Following the 1999 assessments that provided the basis for the declaration that the coastwide canary rockfish stock was overfished, the canary OY was reduced by over 70% in 2000, and by the same margin again over the next three years. Managers employed several tools in an effort to constrain catches to these dramatically lower targets. These included: reductions in trip/bag limits for canary and co-occurring species, the institution of spatial closures, and new gear restrictions intended to reduce trawling in rocky shelf habitats and the coincident catch of rockfish in shelf flatfish trawls. Over that period, the total mortality was near the OY, and well below the ABC. The total 88-year catch was only 14% above the sum of the OYs for 2000-07. This level of removals represents only 35% of the sum of the ABCs for that period.

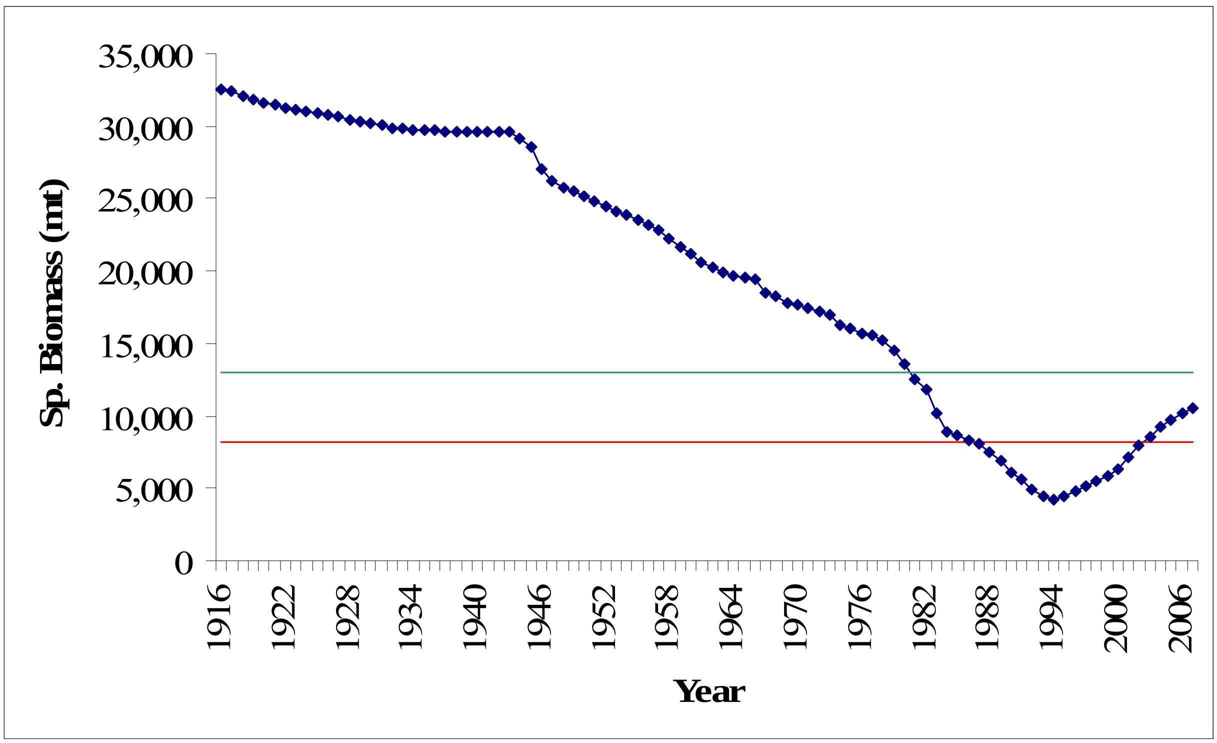


Figure 4-3. Time series of canary rockfish spawning stock size relative to the FMP biomass thresholds for depletion ($B_{25\%}$) and B_{MSY} ($B_{40\%}$).

Evaluation of 2009-2010 Canary Rockfish OY Alternatives

Table 4-5 shows the results of the evaluation of alternative canary rockfish OYs analyzed for 2009-10 using the criteria described in Section 4.2. The canary rockfish OY evaluation has a mixed to high score using these criteria. A relatively low score is assigned using the catch monitoring uncertainty criterion; a relatively moderate score for the rebuilding probability criterion, and relatively high scores for the assessment uncertainty, stock depletion, and extended duration of rebuilding criteria.

Total catch monitoring of canary rockfish is relatively uncertain, particularly since there is a significant portion of the total annual catch taken in recreational fisheries (Tables 4-1, 4-2 and 4-3). Precautionary management of recreational fisheries to stay within the canary OYs and harvest guidelines analyzed in this EIS will continue to be a predominant theme in rebuilding this stock and managing West Coast fisheries in the coming years.

The canary rockfish OYs considered for 2009-10 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. It is 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 2007 assessment received a particularly high level of scientific scrutiny.

The level of spawning stock depletion of canary rockfish, at 32.4%, rates as the one of the highest depletion levels of all the depleted species analyzed in this EIS, second only to widow rockfish at 35.5%. A higher depletion (i.e., a spawning biomass closer to the target biomass, B_{MSY}) suggests higher OYs may be less risky than for stocks that are more severely depleted. However, some caution is still warranted given that a change in the assumed steepness (h) of the stock-recruit function in the 2007 assessment is a significant factor in this more optimistic outlook.

Rebuilding probabilities (P_{MAX}) for alternative canary rockfish OYs analyzed from 0 to 155 mt are all relatively modest at 75%. While these probabilities infer slightly more risk associated with OY alternatives for the most productive overfished species (i.e., widow), it also infers no difference in relative risk across the range of canary OYs analyzed.

The estimated median year to rebuild the canary rockfish stock under the zero-harvest alternative is 2019. An additional year of rebuilding is predicted under the harvest rates used to determine the No Action Alternative and OY Alternatives 1-4 (i.e., 2009-10 OYs of 35-85 mt) an additional two years relative to the zero-harvest alternative under the harvest rates used to determine OY Alternative 5 (2009-10 OY of 105 mt; Prelim. Pref. OY Alt.) and 6 (i.e., 2009-10 OY of 155 mt). The tradeoff in canary OY vs. rebuilding duration across the range of OYs analyzed in this EIS is therefore relatively insignificant, spanning two years between eliminating all fishing-related mortality beginning in 2009 to maintaining the status quo harvest rate in the current rebuilding plan (155 mt in 2009-10).

Table 4-5. Evaluation of alternative 2009-10 canary rockfish OYs relative to the criteria described in Section 4.2.

Evaluation Criteria	OY (mt)							
	Biennial OYs	**No Action OY Alt.**	**OY Alt. 1**	**OY Alt. 2**	**OY Alt. 3**	**OY Alt. 4**	**Prelim. Pref. OY Alt. 5**	**OY Alt. 6**
	Yr. 1	44	0	35	44	85	105	155
	Yr. 2	44	0	35	44	85	105	155
Catch monitoring uncertainty	High uncertainty due to a significant recreational catch component.							
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.							
Stock depletion	32.4%							
Rebuilding Probability (P_{MAX})		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)		1	0	1	1	1	2 a/	2
a/ The stock is predicted to rebuild by 2020 under this harvest rate, or one year longer than $T_{F=0}$. However, the Council's preliminary preferred decision on a target rebuilding year is 2021, or two years longer than $T_{F=0}$.								

Cowcod

Rebuilding Strategies for Cowcod

The prevailing management strategy for rebuilding cowcod is complete avoidance and allowing fisheries with only a "de minimis" 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 2-5). Area management is a particularly effective strategy for protecting cowcod given their sedentary life style and site fidelity. Dick et al. {2008} 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.

Rebuilding Progress of Cowcod

Rebuilding progress for cowcod has been slight since the stock was declared overfished in 2000 (Figure 4-4). A very slow, gradual rebuilding trajectory has been projected for cowcod since the first rebuilding plan in 2000 (Butler and Barnes 2000) due to the very low growth rate and low potential productivity of the stock. The cowcod spawning stock has exhibited some rebuilding progress though, increasing from an estimated minimum depletion of 1.5% in 1989 to 3.8% in 2007 {Dick, et al. 2008}. However, this is still the most depleted groundfish stock assessed on the West Coast.

Management performance under cowcod rebuilding has been consistently good. Total fishing-related mortality of cowcod has been well below rebuilding OYs, 45% below the cumulative OY (2000-07) since rebuilding measures were first implemented.

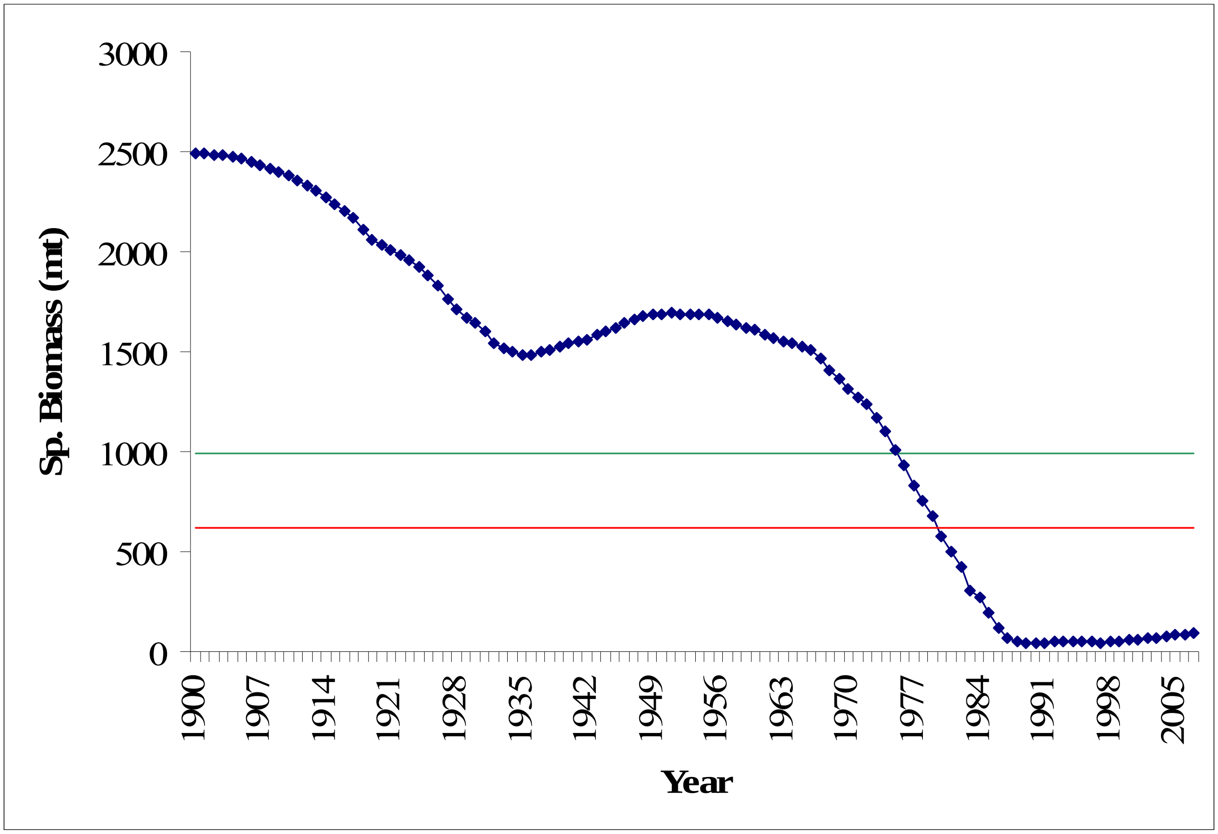


Figure 4-4. Time series of cowcod spawning stock size relative to the FMP biomass thresholds for depletion ($B_{25\%}$) and B_{MSY} ($B_{40\%}$).

<u>Evaluation of 2009-2010 Cowcod OY Alternatives</u>

Table 4-6 shows the results of the evaluation of alternative cowcod OYs analyzed for 2009-10 using the criteria described in Section 4.2. A low score is assigned using all the OY evaluation criteria. This is the most depleted assessed groundfish stock on the West Coast with the longest rebuilding trajectory, which is why the range of OY alternatives considered is necessarily narrow and minimal (0-4 mt).

OY Alternative 2 (2 mt in 2009 and 2010) maintains the current SPR harvest rate and extends rebuilding 4 years beyond $T_{F=0}$. This compares to the preliminary preferred OY alternative (3 mt in 2009 and 2010) and the No Action Alternative/OY Alternative 3 (4 mt in 2009-2010), which extend rebuilding 8 and 11 years beyond $T_{F=0}$, respectively.

Table 4-6. Evaluation of alternative 2009-10 cowcod OYs relative to the criteria described in Section 4.2.

Evaluation Criteria	OY (mt)					
	Biennial OYs	No Action OY Alt.	OY Alt. 1	OY Alt. 2	Prelim. Pref. OY Alt.	OY Alt. 3
	Yr. 1	4	0	2	3	4
	Yr. 2	4	0	2	3	4
Catch monitoring uncertainty	Very high uncertainty due to a paucity of at-sea observations.					
Assessment Uncertainty	Very high uncertainty due to poor data quality.					
Stock depletion	3.8%					
Rebuilding Probability (P_{MAX})		66.2%	78.4%	72.4%	72.4%	66.2%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)		11	0	4	8	11

Darkblotched Rockfish

Rebuilding Strategies for Darkblotched Rockfish

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 4-5). 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.

Area management beyond adjustment of the seaward boundary of the trawl RCA may be an effective rebuilding strategy for darkblotched rockfish. Figure 4-5 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 4-5 is informative, the apparent distribution is also affected by the survey sampling regime in that not all of the combined survey data is shown, zero-catch hauls are not shown, and 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 4-5). These large catches tended to contain larger than average fish (Rogers 2006). Closure of those areas might provide additional darkblotched conservation benefits.

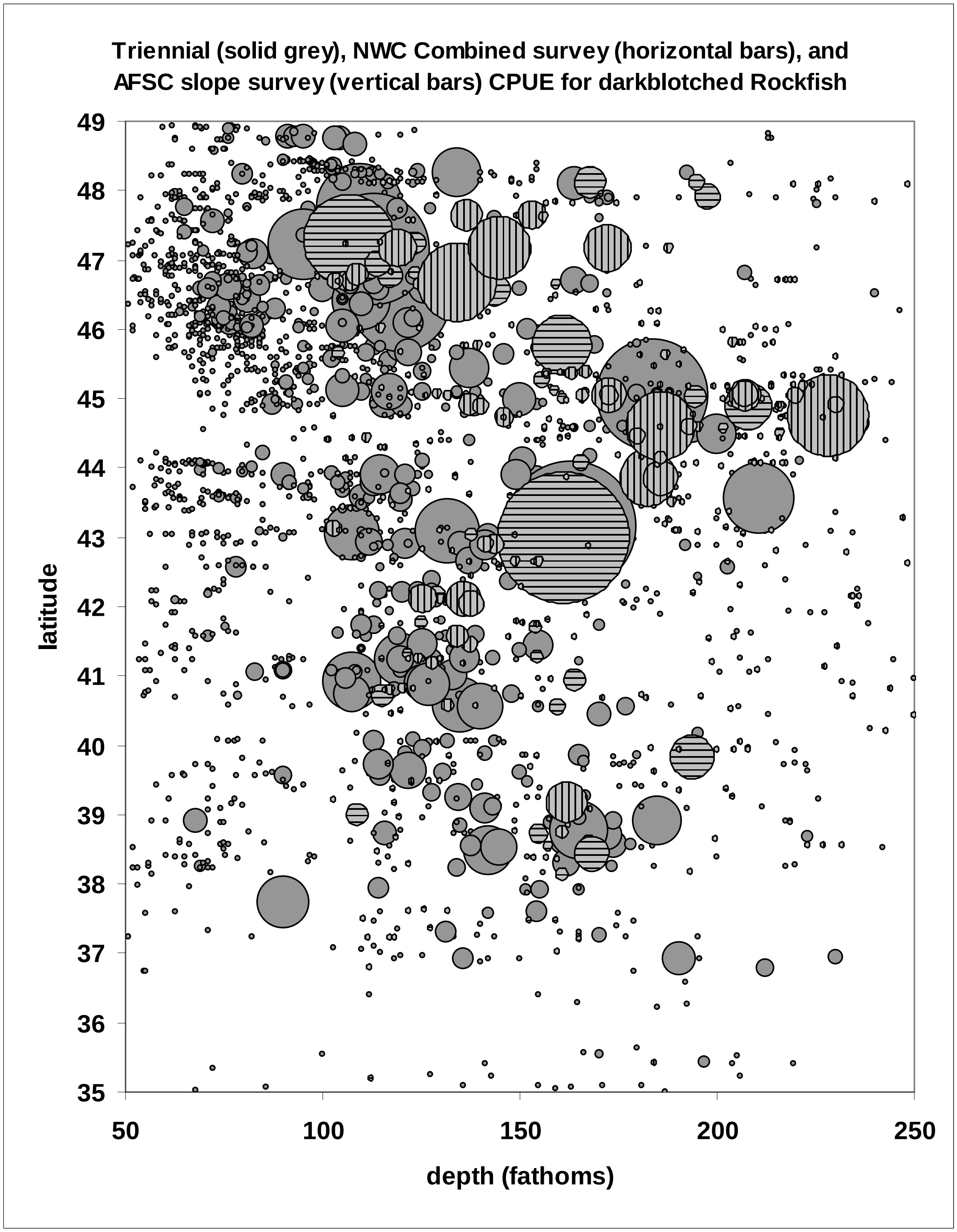


Figure 4-5. Index of West Coast distribution of darkblotched rockfish by latitude and depth as determined by catch per tow in NMFS trawl surveys. Size of circle is proportional to darkblotched rockfish density at that location. Data from NWFSC's West Coast Groundfish Survey Database and the AFSC Triennial Shelf and Slope Survey Database.

Rebuilding Progress of Darkblotched Rockfish

Rebuilding progress for darkblotched rockfish as been significant since the stock was declared overfished in 2001 (Figure 4-6). The spawning stock has increased 85% since its lowest estimated abundance in 1999 and depletion has trended from a low of 10.4% of unfished in 2000 to 22.4% in 2007.

While the annual OY has been exceeded since the implementation of rebuilding measures, total catches have been 97% of the cumulative OY over the rebuilding period (2001-07).

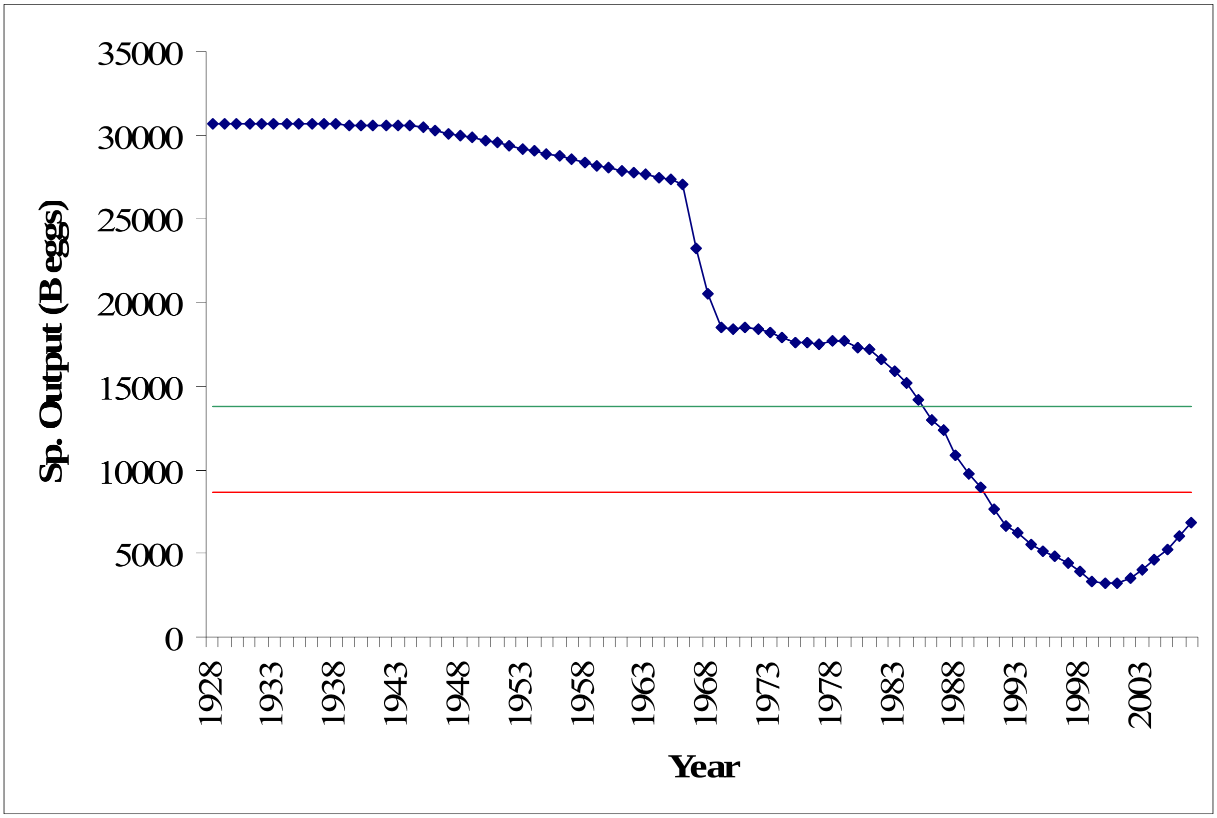


Figure 4-6. Time series of darkblotched rockfish spawning stock size relative to the FMP biomass thresholds for depletion ($B_{25\%}$) and B_{MSY} ($B_{40\%}$).

Evaluation of 2009-2010 Darkblotched Rockfish OY Alternatives

Table 4-7 shows the results of the evaluation of alternative darkblotched rockfish OYs analyzed for 2009-10 using the criteria described in Section 4.2. The darkblotched rockfish OY evaluation has a mixed score using these criteria. Moderate scores are assigned to the evaluation of assessment uncertainty, stock depletion, rebuilding probability, and extended duration of rebuilding criteria; while a relatively high score is assigned the evaluation of the catch monitoring uncertainty criterion.

Catch monitoring of darkblotched rockfish 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 number of observations from the WCGOP.

As in other West Coast groundfish assessments, there is considerable assessment uncertainty associated with fixed and estimated parameters including natural mortality and steepness. However, this is not a data-poor assessment and receives a moderate rank for assessment uncertainty.

The level of darkblotched stock depletion, at 22.4%, is considered a relatively moderate level of depletion. While the stock has performed well under rebuilding, depletion is still below the depletion threshold.

Rebuilding probabilities are relatively high for the lower OY alternatives analyzed (91%-100% for OY alternatives 1-3). The preliminary preferred OY Alternative 4 has a moderate P_{MAX} of 76.7%. While the rebuilding probability for the preliminary preferred OY alternative is higher than that for the No Action Alternative, the evaluation of this criterion indicates a moderate level of rebuilding risk.

The extended duration of rebuilding criterion receives a moderate score based on the moderate rebuilding periods associated with alternative darkblotched OYs of 0-12 years beyond $T_{F=0}$ for OY Alternatives 2-4. The preliminary preferred OY Alternative rebuilds faster than the No Action OY Alternative but extends rebuilding 5 years longer than OY Alternative 3, 8 years longer than OY Alternative 2, and 12 years longer than the zero-harvest rebuilding alternative.

Table 4-7. Evaluation of alternative 2009-10 darkblotched rockfish OYs relative to the criteria described in Section 4.2.

Evaluation Criteria	OY (mt)					
	Biennial OYs	**No Action OY Alt.**	**OY Alt. 1**	**OY Alt. 2**	**OY Alt. 3**	**Prelim. Pref. OY Alt. 4**
	Yr. 1	290	0	159	229	300
	Yr. 2	330	0	165	235	306
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.					
Assessment Uncertainty	Moderate uncertainty.					
Stock depletion	22.4%					
Rebuilding Probability (P_{MAX})		<76.7%	100.0%	97.7%	91.0%	76.7%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)		>12	0	4	7	12

Pacific Ocean Perch

Rebuilding Strategies for Pacific Ocean Perch

Pacific ocean perch have been under rebuilding since 1981. The population off the northern U.S. West Coast (Columbia and U.S.-Vancouver areas) is at the southern extreme of the stock and rebuilding potential may be more affected 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.

Rebuilding Progress of Pacific Ocean Perch

Rebuilding progress of POP has been moderate with a 48% increase in spawning biomass since the stock's lowest abundance in 1996 (Figure 4-7). The depletion has increased from a low of 18.5% in 1996 to 27.5% in 2007.

Total catches of POP have remained below rebuilding OYs during the course of rebuilding since the stock was declared overfished in 1999. Total cumulative catch during 2000-06 has been 42% of the cumulative OYs during this rebuilding period.

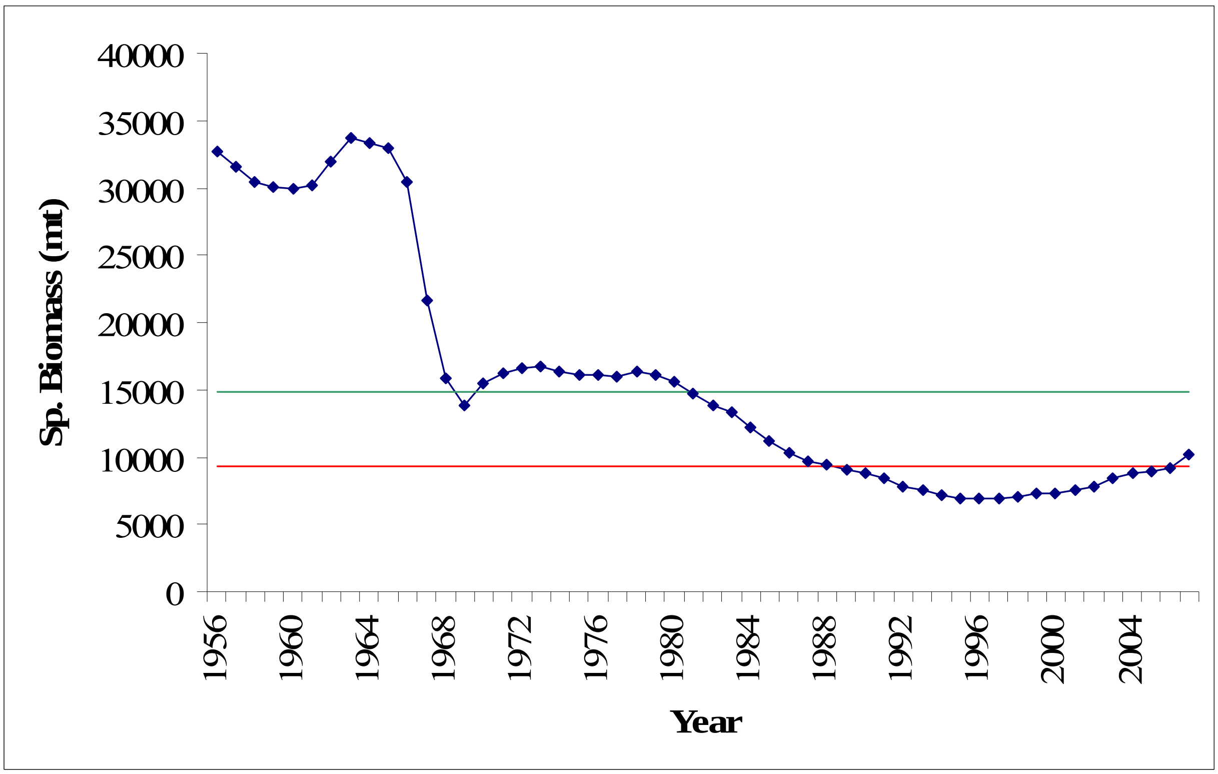


Figure 4-7. Time series of Pacific ocean perch spawning stock size relative to the FMP biomass thresholds for depletion ($B_{25\%}$) and B_{MSY} ($B_{40\%}$).

Evaluation of 2009-2010 Pacific Ocean Perch OY Alternatives

Table 4-8 shows the results of the evaluation of alternative POP OYs analyzed for 2009-10 using the criteria described in Section 4.2. The POP OY evaluation has a relatively high score using these criteria, high scores for all criteria except stock depletion, which was assigned a moderate score.

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.

Stock depletion is 27.5%, while higher than all the depleted species except canary and widow, is only barely above the depletion threshold. A moderate score for this criterion is therefore warranted.

Rebuilding probabilities are high for all the OY alternatives with the lowest P_{MAX} being 94.4%. This criterion receives a high score and all the OYs within the range analyzed are considered relatively risk-averse.

A high score was also assigned to the extended duration of rebuilding criterion with only a year of extended rebuilding for the No Action Alternative, OY Alternative 3, and the preliminary preferred OY Alternative 4 relative to $T_{F=0}$.

Table 4-8. Evaluation of alternative 2009-10 Pacific ocean perch OYs relative to the criteria described in Section 4.2.

Evaluation Criteria	OY (mt)					
	Biennial OYs	No Action OY Alt.	OY Alt. 1	OY Alt. 2	OY Alt. 3	Prelim. Pref. OY Alt. 4
	Yr. 1	150	0	130	164	189
	Yr. 2	150	0	137	173	200
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.					
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.					
Stock depletion	27.5%					
Rebuilding Probability (P_{MAX})		>95.0%	100.0%	95.6%	95.0%	94.4%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)		1	0	0	1	1

Widow Rockfish

Rebuilding Strategies for Widow Rockfish

The Council chose to eliminate the non-tribal midwater trawl fishery targeting yellowtail and widow rockfish in 2003 to reduce widow rockfish exploitation (PFMC 2003c). 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 percent 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 2005–06 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 percent 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 4-8). The at-sea vessels receive daily reports of bycatch by vessels in their fishery, where there is 100 percent 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.

In recent years, the widow bycatch rate in whiting trawl fisheries has increased steadily as widow have become more abundant (Figure 4-8). The whiting fishery was prematurely closed early in 2007, before whiting quotas were caught by the shoreside and catcher-processor sectors because the whiting bycatch limit was exceeded. The fishery was able to proceed later in the year since there was still available widow yield and the OY was not exceeded (Table 4-3). This experience highlighted the need for improvements in bycatch limit management and total catch monitoring in the whiting fishery and led the Council to recommend analysis of many of the alternative whiting fishery management measures described in section 2.2.4.2.

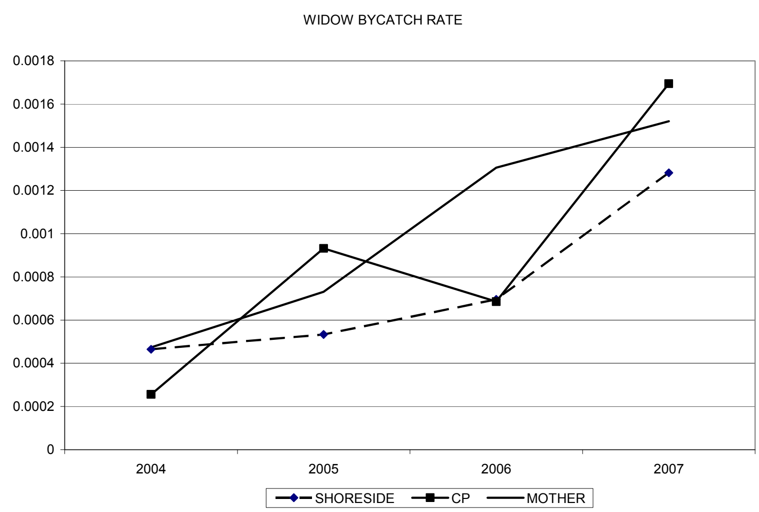


Figure 4-8. Annual widow rockfish bycatch rate by non-tribal whiting fishery sector from 2004 to 2007 (prior to the early closure on July 26).

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 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 percent 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 has operated under an EFP[2] 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 percent 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 percent 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. Starting in 2006, camera monitoring is mandated in the Shoreside Whiting EFP and will soon be part of the permanent regulations after a final Amendment 10 rule is adopted.

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 echo sounder 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

[2] Maximized retention is anticipated soon under Amendment 10 rulemaking, obviating the need for an EFP to prosecute full retention rules.

"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.

Rebuilding Progress of Widow Rockfish

Rebuilding progress of widow rockfish has been significant since the stock was declared overfished in 2001 (Figure 4-9). The stock's spawning output has increased by over 13% since the 2003 minimum. The rebuilding outlook is excellent with successful rebuilding (i.e., attainment of the B_{MSY} level) projected for next year over a wide range of harvest rates, including harvest rates much higher than contemplated for 2009-10 management. This outlook is based on confirmed strong year classes entering the spawning population. A retrospective look at depletion indicates the spawning stock reached a minimum depletion of 31.3% in 2003, which is coincidentally above the depletion threshold (i.e., the stock was never overfished). Nevertheless, the Council announced in 2006 that it intends to continue managing widow rockfish under the rebuilding plan. Stock depletion is estimated to be 35.5% in 2007, less than 5% below the rebuilding target.

Rebuilding management measures have performed well, with the cumulative total catch during the rebuilding period (2002-07) only 48% of cumulative OYs.

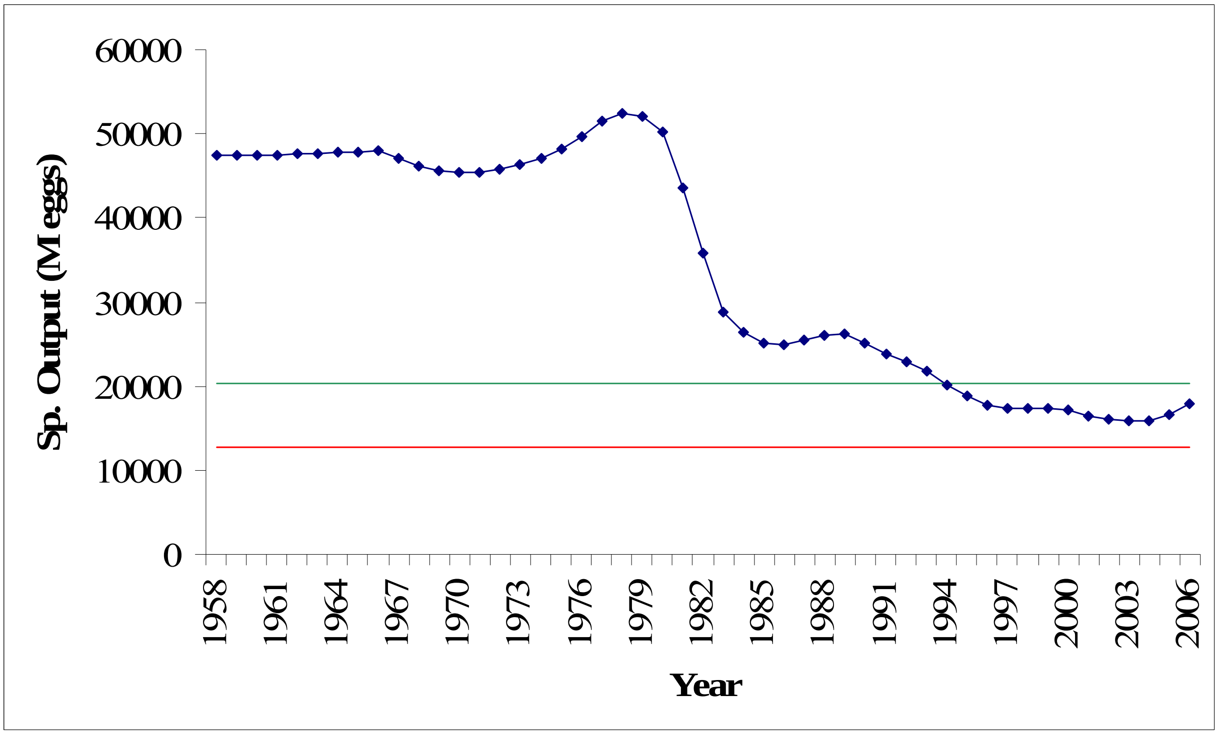


Figure 4-9. Time series of widow rockfish spawning stock size relative to the FMP biomass thresholds for depletion ($B_{25\%}$) and B_{MSY} ($B_{40\%}$).

Evaluation of 2009-2010 Widow Rockfish OY Alternatives

Table 4-9 shows the results of the evaluation of alternative widow rockfish OYs analyzed for 2009-10 using the criteria described in Section 4.2. The evaluation of widow rockfish OY alternatives scored high relative to these criteria, with only the assessment uncertainty criterion rated with a low to moderate score.

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 depleted 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.)

All of the widow rockfish OY alternatives analyzed in this EIS have P_{MAX} rebuilding probabilities of 100%, indicating 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 extremely short rebuilding times predicted across a large range of OYs (Table 2-3 and Figure 2-2). All the OY alternatives analyzed are predicted to rebuild in the shortest time possible (2009, as is projected for the zero-harvest alternative).

Table 4-9. Evaluation of alternative 2009-10 widow rockfish OYs relative to the criteria described in Section 4.2.

Evaluation Criteria	OY (mt)					
	Biennial OYs	**No Action OY Alt.**	**OY Alt. 1**	**OY Alt. 2**	**Prelim. Pref. OY Alt.**	**OY Alt. 3**
	Yr. 1	368	0	371	475	522
	Yr. 2	368	0	362	475	509
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.					
Assessment Uncertainty	Relatively uncertain due to lack of a reliable abundance index.					
Stock depletion	35.5%					
Rebuilding Probability (P_{MAX})		100.0%	100.0%	100.0%	100.0%	100.0%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)		0	0	0	0	0

Yelloweye Rockfish

Rebuilding Strategies for Yelloweye Rockfish

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 (YRCAs) are likely to be most effective at reducing incidental mortality in hook and line fisheries. Figure 4-10 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 in the trawl fishery.

Yelloweye rockfish are a transboundary stock ranging from the Bering Sea and Gulf of Alaska south to Baja California. On the U.S. West Coast the distribution of yelloweye is skewed to the north, with the areas of highest density off the north Washington coast. Canadian fisheries target yelloweye rockfish a few miles north of the U.S.-Canada border, while retention is prohibited in U.S. waters. Without any genetic evidence indicating the Canadians are fishing on a different stock, the close proximity of yelloweye populations in U.S. and Canadian waters infers both nations are fishing on the same stock, but obviously under a different management strategy. Successful rebuilding of yelloweye rockfish may ultimately be most influenced by an international agreement with Canada to develop a joint assessment and management approach. This same reasoning can also be applied to other transboundary stocks under rebuilding such as canary rockfish and POP.

Rebuilding Progress of Yelloweye Rockfish

Rebuilding progress of yelloweye rockfish has been moderate with spawning stock biomass estimated to have increased by 36% since its low point in 2000 (Figure 4-11). Spawning stock abundance has increased slowly from a low depletion rate of 12.1% in 2000 to 16.4% in 2007.

Management measures have performed well at staying within rebuilding OYs with total cumulative catch during the rebuilding period (2002-07) at 73% of the cumulative OYs. However, under the status quo harvest rate ramp-down strategy, staying within future OYs without eliminating significant hook-and-line fishing opportunities will be a significant challenge.

Evaluation of 2009-2010 Yelloweye Rockfish OY Alternatives

Table 4-10 shows the results of the evaluation of alternative yelloweye rockfish OYs analyzed for 2009-10 using the criteria described in Section 4.2. Low scores were assigned to the alternative OYs using all criteria evaluated.

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 bottom trawl surveys 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.

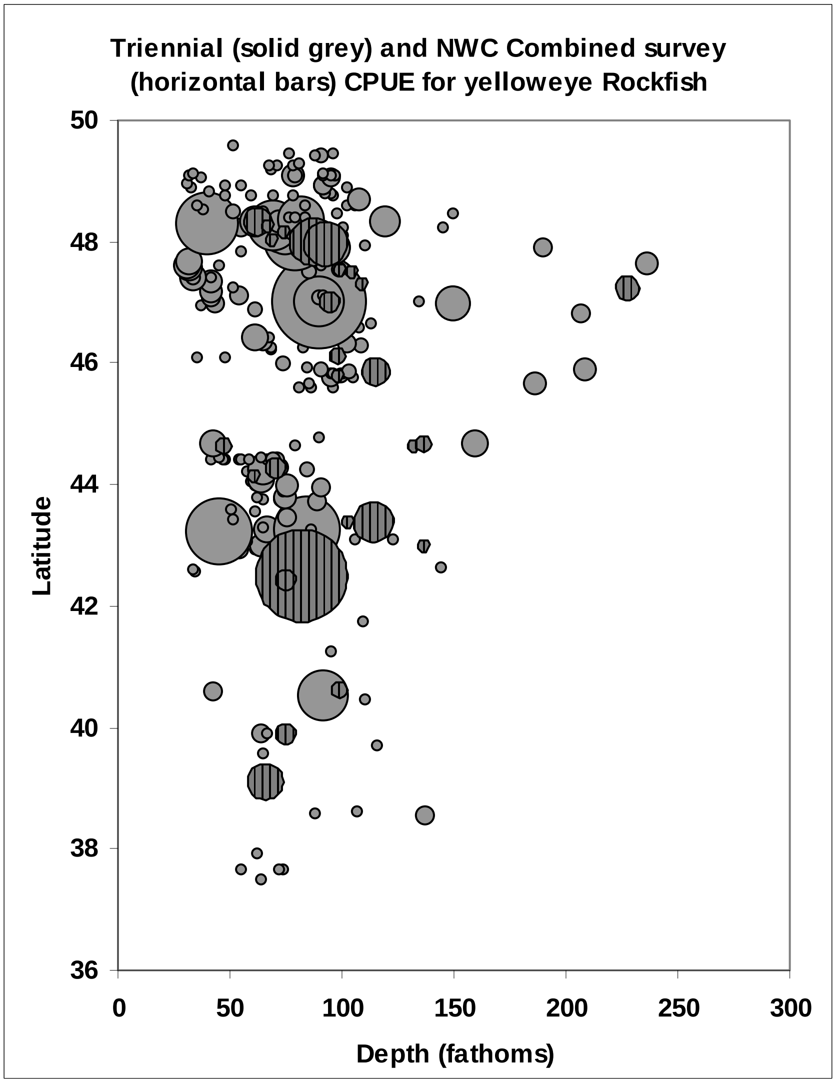


Figure 4-10. Index of West Coast distribution of yelloweye rockfish by latitude and depth as determined by catch per tow in NMFS trawl surveys. Size of circle is proportional to yelloweye rockfish density at that location. Data from NWFSC's West Coast Groundfish Survey Database and the AFSC Triennial Shelf and Slope Survey Database.

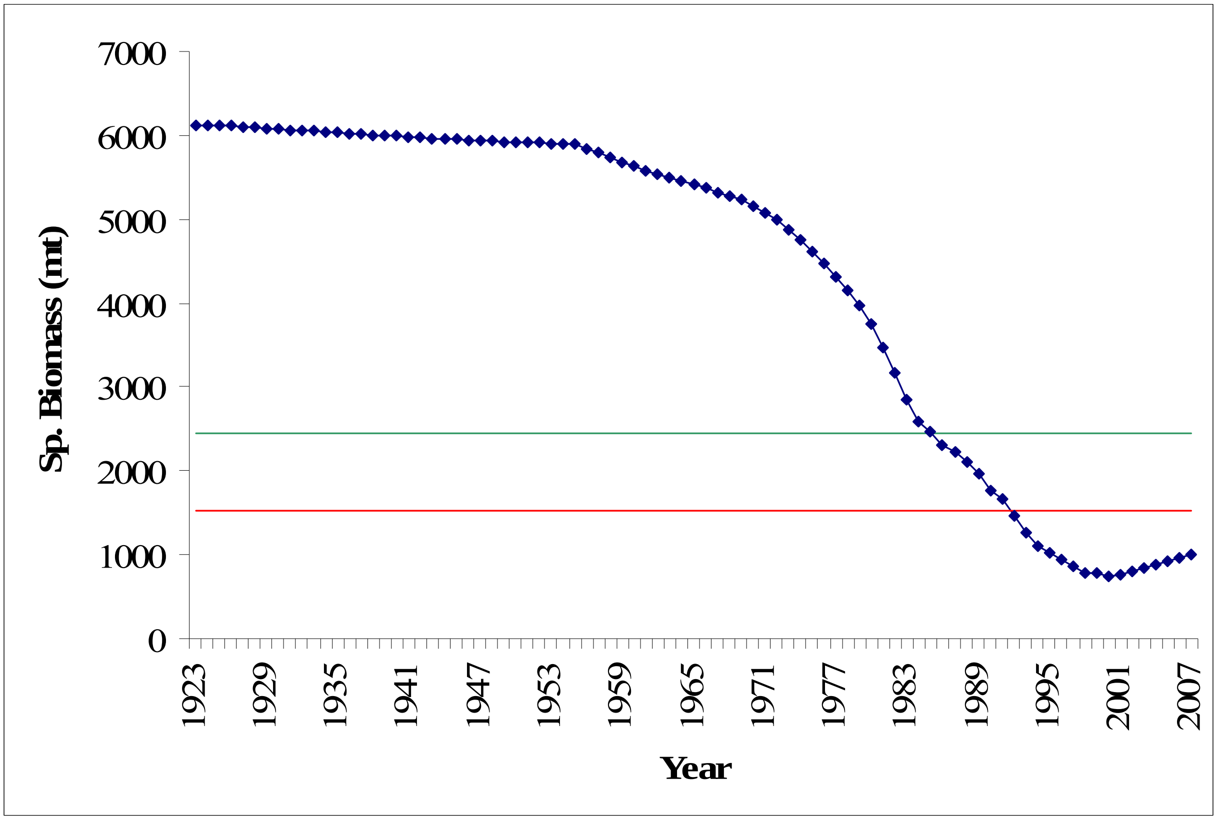


Figure 4-11. Time series of yelloweye rockfish spawning stock size relative to the FMP biomass thresholds for depletion ($B_{25\%}$) and B_{MSY} ($B_{40\%}$).

Rebuilding probabilities are relatively low for the yelloweye OY alternatives considered for 2009-10, ranging from 100% under the zero-harvest alternative to 50% (the lower legal limit) for OY Alternative 4. These preliminary preferred OY (the status quo ramp-down strategy; 17 mt in 2009 and 14 mt in 2010) has a P_{MAX} of about 69%. This compares to a P_{MAX} <50% under the status quo OY, which is under the lower legal limit.

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 is 2049 (Table 2-3). The harvest rate used to determine OY Alternative 2 (13 mt in 2009 and 14 mt in 2010) and the preliminary preferred OY Alternative 3 is estimated to extend rebuilding an additional 33 years beyond that, while OY alternatives 4 and 5 are estimated to extend rebuilding an additional 41 and 35 years, respectively from $T_{F=0}$.

The Council chose the ramp-down strategy as its preliminary preferred alternative. Their rationale for the ramp-down strategy was the need to overhaul the management regime to accommodate the lower harvest rate and, most notably, determine the best way to manage future commercial and recreational fisheries targeting Pacific halibut, which is where most of the current yelloweye fishing-related mortality occurs. Additionally, the Council wants to better explore available spatial data to determine a potentially more comprehensive and effective area management strategy for reducing yelloweye mortalities. OY Alternative 4 is an alternative harvest rate ramp-down strategy that holds the OY constant at 17 mt in 2009 and 2010 before resuming a constant harvest rate strategy. This alternative was considered due to the higher than anticipated yelloweye bycatch in the northern California recreational groundfish fishery in 2007. The rationale for this alternative is CDFG may need more time to determine effective YRCAs to reduce yelloweye bycatch in their fisheries.

Table 4-10. Evaluation of alternative 2009-10 yelloweye rockfish OYs relative to the criteria described in Section 4.2.

Evaluation Criteria	OY (mt)						
	Biennial OYs	**No Action OY Alt.**	**OY Alt. 1**	**OY Alt. 2**	**Prelim. Pref. OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**
	Yr. 1	23	0	13	17	15	17
	Yr. 2	20	0	14	14	15	17
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.						
Stock depletion	16.4%						
Rebuilding Probability (P_{MAX})		<50%	100.0%	69.5%	68.9%	50.0%	>68.9%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)		>41	0	33	35 a/	41	35
a/ The stock is predicted to rebuild by 2082 under this harvest rate, or 33 years longer than $T_{F=0}$. However, the Council's preliminary preferred decision is to maintain the status quo target rebuilding year of 2084, or 35 years longer than $T_{F=0}$.							

[The rest of Chapter 4 regarding analysis of harvest specifications for non-overfished species, analysis of rebuilding alternatives, description of impact analysis models and analysis of alternative management measures will be provided in one or more supplemental attachments to the June briefing book]

Agenda Item F.4.a
Supplemental Attachment 2
June 2008

This preliminary draft of Chapter 4 of the 2009-10 Groundfish Harvest Specifications and Management Measures Environmental Impact Statement appends to Agenda Item F.4.a, Attachment 1, which is comprised of draft Chapter 2 and the first section of draft Chapter 4.

4.3.1.2 *Impacts of Rebuilding Alternatives*

The analysis of rebuilding alternatives (Table 2-4) is designed by the GMT to show the trade-offs associated with the mix of depleted species' OYs under consideration for 2009-10 fisheries. Since the available yield of each depleted species will differentially constrain groundfish fishing sectors due to catchability of the gears used by each sector, comparing the management measures by sector across these rebuilding alternatives reveals the trade-offs in deciding 2009-10 OYs and potentially revised rebuilding plans for depleted species. The following section describes the implications of 2009-10 rebuilding alternatives for each non-tribal groundfish sector.

Most 2009-10 West Coast groundfish fisheries will likely be constrained by the low yelloweye OYs considered, including the OYs under the status quo ramp-down strategy. All commercial and recreational hook and line fisheries will be constrained by yelloweye. Even the limited entry non-whiting trawl fishery is likely to be constrained by yelloweye, although canary is still a constraining species under the lower OYs analyzed. Only the limited entry whiting trawl fishery is not likely to be constrained by yelloweye. There is very little yelloweye bycatch in whiting-directed fisheries. However, the widow OYs will likely to be a constraining species for 2009-10 whiting fisheries and canary rockfish, under the lower OYs analyzed, may also constrain whiting fishing opportunities.

As stated in section 2.1.1.8, Rebuilding Alternative 1 is designed to allow more fishing opportunities on the continental shelf north and south of 40°10' N latitude by specifying relatively higher OYs for bocaccio, canary rockfish, cowcod, widow rockfish and yelloweye rockfish, while allowing fewer fishing opportunities on the slope by specifying relatively lower OYs for darkblotched rockfish and POP. Rebuilding Alternative 2 is conversely designed to allow fewer fishing opportunities on the shelf north and south of 40°10' N latitude by specifying relatively lower OYs for the shelf species (bocaccio, canary, cowcod, widow, and yelloweye), and higher fishing opportunities on the slope by specifying relatively higher OYs for the slope species (darkblotched and POP). Rebuilding Alternative 3 is the most restrictive coastwide since it is constructed with relatively low OYs for all the depleted species. Rebuilding Alternative 4 is the most liberal coastwide since it is constructed with relatively high OYs for all the depleted species. Rebuilding Alternatives 5a and 5b allow mixed fishing opportunities by sector north and south of 40°10' N latitude and in shallow and deeper waters and are designed to show further trade-offs between rebuilding OYs that may not be captured by rebuilding alternatives 1 through 4. Finally, the preferred depleted species OYs in 2009 and 2010 are analyzed as the preferred rebuilding alternative.

Limited Entry Non-Whiting Trawl

Tables 4-11 and 4-23 provide example 2009-10 limited entry trawl trip limits and RCA configurations under the constraints imposed by each Rebuilding Alternative. The predicted total catch of target and depleted species under each trawl scenario are provided in Tables 4-12 to 4-24. (Trip limit and impact tables follow each other under each rebuilding alternative).

Table 4-11. Limited entry trawl trip limits and seasonal RCA configurations designed to optimize fishing opportunities under Rebuilding Alternative 1.

Subarea	Period	RCA Boundaries (fm)		Sablefish	Longspine	Shortspine	Dover Sole	Other Flatfish	Petrale Sole	Arrowtooth Flounder	Slope Rockfish b/
		Shoreward a/	Seaward								
North Large Footrope	1	75	250 c/	15,000	8,000	8,000	50,000	90,000	50,000	90,000	2,000
	2	75	250	15,000	8,000	8,000	50,000	90,000	30,000	90,000	2,000
	3	75	250	15,000	8,000	8,000	50,000	90,000	30,000	90,000	2,000
	4	75	250	15,000	8,000	8,000	50,000	90,000	30,000	90,000	2,000
	5	75	250	15,000	8,000	8,000	50,000	90,000	30,000	90,000	2,000
	6	75	250 c/	15,000	8,000	8,000	50,000	90,000	50,000	90,000	2,000
North SFFT	1	75	250 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
	2	75	250	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	3	75	250	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	4	75	250	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	5	75	250	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	6	75	250 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
38°-40°10' N lat. d/	1	100	200 c/	15,000	8,000	8,000	50,000	90,000	50,000	10,000	15,000
	2	100	200	15,000	8,000	8,000	50,000	90,000	30,000	10,000	15,000
	3	100	200	15,000	8,000	8,000	50,000	90,000	30,000	10,000	15,000
	4	100	200	15,000	8,000	8,000	50,000	90,000	30,000	10,000	10,000
	5	100	200	15,000	8,000	8,000	50,000	90,000	30,000	10,000	10,000
	6	100	200 c/	15,000	8,000	8,000	50,000	90,000	50,000	10,000	15,000
S 38° N lat. d/	1	100	150	15,000	8,000	8,000	50,000	90,000	50,000	10,000	40,000
	2	100	150	15,000	8,000	8,000	50,000	90,000	30,000	10,000	40,000
	3	100	150	15,000	8,000	8,000	50,000	90,000	30,000	10,000	40,000
	4	100	150	15,000	8,000	8,000	50,000	90,000	30,000	10,000	40,000
	5	100	150	15,000	8,000	8,000	50,000	90,000	30,000	10,000	40,000
	6	100	150	15,000	8,000	8,000	50,000	90,000	50,000	10,000	40,000

a/ Areas shoreward of the RCA north of Cape Alava are closed.
b/ Splitnose rockfish limits equal to slope rockfish limits.
c/ The seaward RCA boundary is modified to include specified petrale sole fishing areas.
d/ Chilipepper rockfish limits using small footropes are 5,000 lbs/2 months in the south.

Table 4-12. The predicted total catch (mt) of target and depleted species in the 2009-10 limited entry trawl fishery north and south of 40°10' N latitude under Rebuilding Alternative 1.

Species	Total Catch (mt) by Area		
	North	South	Total
Canary	11.1	2.6	13.7
POP	35.8	0.0	35.8
Darkblotched	100.4	17.4	117.8
Widow	1.2	3.8	5.0
Bocaccio	-	9.7	9.7
Yelloweye	0.6	0.0	0.6
Cowcod	-	1.1	1.1
Sablefish	1,742.8	452.8	2,195.6
Longspine	252.0	189.9	441.9
Shortspine	450.0	161.2	611.3
Dover	4,923.0	1,355.6	6,278.5
Arrowtooth	1,697.0	86.0	1,782.9
Petrale	2,068.8	318.7	2,387.5
Other Flatfish	1,307.9	446.3	1,754.2
Slope Rockfish	56.3	146.0	202.2

Table 4-13. Limited entry trawl trip limits and seasonal RCA configurations designed to optimize fishing opportunities under Rebuilding Alternative 2.

Subarea	Period	RCA Boundaries (fm) Shoreward	RCA Boundaries (fm) Seaward	Sablefish	Longspine	Shortspine	Dover Sole	Other Flatfish	Petrale Sole	Arrowtooth Flounder	Slope Rockfish a/
North Large Footrope	1	0	200 b/	20,000	22,000	14,000	90,000	110,000	115,000	150,000	2,000
	2	0	200	20,000	22,000	14,000	90,000	110,000	50,000	150,000	2,000
	3	0	150	20,000	22,000	14,000	90,000	110,000	30,000	150,000	2,000
	4	75	WA/ 200 OR	20,000	22,000	14,000	90,000	110,000	30,000	150,000	2,000
	5	0	200	20,000	22,000	14,000	90,000	110,000	50,000	150,000	2,000
	6	0	200 b/	20,000	22,000	14,000	90,000	110,000	115,000	150,000	2,000
North SFFT c/	1	0	200 b/	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	2	0	200								
	3	0	150								
	4	75	WA/ 200 OR								
	5	0	200								
	6	0	200 b/								
38°-40°10' N lat.	1	75	150	20,000	22,000	14,000	90,000	110,000	115,000	10,000	15,000
	2	75	150	20,000	22,000	14,000	90,000	110,000	50,000	10,000	15,000
	3	100	150	20,000	22,000	14,000	90,000	110,000	30,000	10,000	15,000
	4	100	150	20,000	22,000	14,000	90,000	110,000	30,000	10,000	10,000
	5	100	150	20,000	22,000	14,000	90,000	110,000	50,000	10,000	10,000
	6	75	150	20,000	22,000	14,000	90,000	110,000	115,000	10,000	15,000
S 38° N lat.	1	75	150	20,000	22,000	14,000	90,000	110,000	115,000	10,000	40,000
	2	75	150	20,000	22,000	14,000	90,000	110,000	50,000	10,000	40,000
	3	100	150	20,000	22,000	14,000	90,000	110,000	30,000	10,000	40,000
	4	100	150	20,000	22,000	14,000	90,000	110,000	30,000	10,000	40,000
	5	75	150	20,000	22,000	14,000	90,000	110,000	50,000	10,000	40,000
	6	75	150	20,000	22,000	14,000	90,000	110,000	115,000	10,000	40,000

a/ Splitnose rockfish limits equal to slope rockfish limits.
b/ The seaward RCA boundary is modified to include specified petrale sole fishing areas.
c/ Vessels using selective flatfish gear in the north in periods 1, 2, 3, 5, and 6 are not held to a lower limit

Table 4-14. The predicted total catch (mt) of target and depleted species in the 2009-10 limited entry trawl fishery north and south of 40°10' N latitude under Rebuilding Alternative 2.

Species	Total Catch (mt) by Area North	South	Total
Canary	1.7	2.6	4.3
POP	92.6	0.0	92.6
Darkblotched	207.8	32.8	240.5
Widow	1.8	5.5	7.3
Bocaccio	-	11.1	11.1
Yelloweye	0.1	0.0	0.1
Cowcod	-	1.0	1.0
Sablefish	2,386.8	610.8	2,997.7
Longspine	448.3	338.7	787.0
Shortspine	880.8	284.0	1,164.8
Dover	8,192.7	2,334.7	10,527.5
Arrowtooth	1,276.6	49.4	1,326.0
Petrale	1,945.2	362.0	2,307.2
Other Flatfish	970.8	556.2	1,527.0
Slope Rockfish	91.8	185.4	277.2

Table 4-15. Limited entry trawl trip limits and seasonal RCA configurations designed to optimize fishing opportunities under Rebuilding Alternative 3.

Subarea	Period	RCA Boundaries (fm)		Sablefish	Longspine	Shortspine	Dover Sole	Other Flatfish	Petrale Sole	Arrowtooth Flounder	Slope Rockfish a/
		Shoreward	Seaward								
North Large Footrope	1	0	250 b/	11,000	6,000	5,000	30,000	110,000	50,000	50,000	2,000
	2	0	250	11,000	6,000	5,000	30,000	110,000	30,000	50,000	2,000
	3	0	250	11,000	6,000	5,000	30,000	110,000	30,000	50,000	2,000
	4	75	250	11,000	6,000	5,000	30,000	110,000	30,000	50,000	2,000
	5	0	250	11,000	6,000	5,000	30,000	110,000	30,000	50,000	2,000
	6	0	250 b/	11,000	6,000	5,000	30,000	110,000	50,000	50,000	2,000
North SFFT c/	1	0	250 b/	5,000	3,000	3,000	25,000	50,000	16,000	50,000	2,000
	2	0	250								
	3	0	250								
	4	75	250								
	5	0	250								
	6	0	250 b/								
38°-40°10' N lat.	1	75	200 b/	30,000	30,000	30,000	100,000	110,000	70,000	10,000	15,000
	2	100	200	30,000	30,000	30,000	100,000	110,000	30,000	10,000	15,000
	3	100	200	30,000	30,000	30,000	100,000	110,000	30,000	10,000	15,000
	4	100	200	30,000	30,000	30,000	100,000	110,000	30,000	10,000	10,000
	5	75	200	30,000	30,000	30,000	100,000	110,000	30,000	10,000	10,000
	6	75	200 b/	30,000	30,000	30,000	100,000	110,000	70,000	10,000	15,000
S 38° N lat.	1	75	150	30,000	30,000	30,000	100,000	110,000	70,000	10,000	40,000
	2	100	150	30,000	30,000	30,000	100,000	110,000	30,000	10,000	40,000
	3	100	150	30,000	30,000	30,000	100,000	110,000	30,000	10,000	40,000
	4	100	150	30,000	30,000	30,000	100,000	110,000	30,000	10,000	40,000
	5	75	150	30,000	30,000	30,000	100,000	110,000	30,000	10,000	40,000
	6	75	150	30,000	30,000	30,000	100,000	110,000	70,000	10,000	40,000

a/ Splitnose rockfish limits equal to slope rockfish limits.

b/ The seaward RCA boundary is modified to include specified petrale sole fishing areas.

c/ Vessels using selective flatfish gear in the north in periods 1, 2, 3, 5, and 6 are not held to a lower limit

Table 4-16. The predicted total catch (mt) of target and depleted species in the 2009-10 limited entry trawl fishery north and south of 40°10' N latitude under Rebuilding Alternative 3.

Species	Total Catch (mt) by Area		
	North	South	Total
Canary	1.3	2.8	4.1
POP	31.6	0.0	31.6
Darkblotched	91.5	38.2	129.6
Widow	1.0	6.9	7.9
Bocaccio	-	10.1	10.1
Yelloweye	0.1	0.0	0.1
Cowcod	-	1.0	1.0
Sablefish	1,248.0	909.9	2,157.9
Longspine	238.7	461.8	700.5
Shortspine	284.7	607.6	892.4
Dover	2,926.9	2,614.1	5,540.9
Arrowtooth	1,028.0	49.7	1,077.7
Petrale	1,548.4	329.7	1,878.1
Other Flatfish	984.8	541.8	1,526.6
Slope Rockfish	56.3	165.0	221.3

Table 4-17. Limited entry trawl trip limits and seasonal RCA configurations designed to optimize fishing opportunities under Rebuilding Alternative 4.

Subarea	Period	RCA Boundaries (fm)		Sablefish	Longspine	Shortspine	Dover Sole	Other Flatfish	Petrale Sole	Arrowtooth Flounder	Slope Rockfish b/
		Shoreward a/	Seaward								
North Large Footrope	1	75	200 c/	18,000	22,000	14,000	110,000	110,000	40,000	150,000	2,000
	2	75	200	20,000	22,000	14,000	110,000	110,000	30,000	150,000	2,000
	3	75	150 WA/	20,000	22,000	14,000	110,000	110,000	30,000	150,000	2,000
	4	75	200 OR	20,000	22,000	14,000	110,000	110,000	30,000	150,000	2,000
	5	75	200	20,000	22,000	14,000	110,000	110,000	30,000	150,000	2,000
	6	75	200 c/	18,000	22,000	14,000	110,000	110,000	40,000	150,000	2,000
North SFFT	1	75	200 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
	2	75	200	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	3	75	150 WA/	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	4	75	200 OR	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	5	75	200	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	6	75	200 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
38°-40°10' N lat. d/	1	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	15,000
	2	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	15,000
	3	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	15,000
	4	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	10,000
	5	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	10,000
	6	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	15,000
S 38° N lat. d/	1	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	40,000
	2	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	3	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	4	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	5	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	6	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	40,000

a/ Areas shoreward of the RCA north of Cape Alava are closed.
b/ Splitnose rockfish limits equal to slope rockfish limits.
c/ The seaward RCA boundary is modified to include specified petrale sole fishing areas.
d/ Chilipepper rockfish limits using small footropes are 5,000 lbs/2 months in the south.

Table 4-18. The predicted total catch (mt) of target and depleted species in the 2009-10 limited entry trawl fishery north and south of 40°10' N latitude under Rebuilding Alternative 4.

Species	Total Catch (mt) by Area		
	North	South	Total
Canary	12.8	2.8	15.5
POP	86.1	0.0	86.1
Darkblotched	195.5	35.7	231.3
Widow	1.8	6.2	8.0
Bocaccio	-	12.3	12.3
Yelloweye	0.7	0.0	0.7
Cowcod	-	1.3	1.3
Sablefish	2,380.1	596.5	2,976.6
Longspine	445.9	338.7	784.6
Shortspine	859.8	284.2	1,144.0
Dover	10,692.6	3,012.3	13,704.9
Arrowtooth	1,836.4	64.0	1,900.4
Petrale	1,951.5	342.6	2,294.1
Other Flatfish	1,571.4	558.5	2,129.9
Slope Rockfish	91.8	185.4	277.2

Table 4-19. Limited entry trawl trip limits and seasonal RCA configurations designed to optimize fishing opportunities under Rebuilding Alternatives 5a and 5b.

Subarea	Period	RCA Boundaries (fm) Shoreward a/	RCA Boundaries (fm) Seaward	Sablefish	Longspine	Shortspine	Dover Sole	Other Flatfish	Petrale Sole	Arrowtooth Flounder	Slope Rockfish b/
North Large Footrope	1	75	200 c/	20,000	22,000	14,000	100,000	110,000	50,000	150,000	2,000
	2		200	20,000	22,000	14,000	100,000	110,000	30,000	150,000	2,000
	3		150	20,000	22,000	14,000	100,000	110,000	30,000	150,000	2,000
	4		WA/ 200 OR	20,000	22,000	14,000	100,000	110,000	30,000	150,000	2,000
	5		200	20,000	22,000	14,000	100,000	110,000	30,000	150,000	2,000
	6		200 c/	20,000	22,000	14,000	100,000	110,000	50,000	150,000	2,000
North SFFT	1	75	200 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
	2		200	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	3		150	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	4		WA/ 200 OR	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	5		200	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	6		200 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
38°-40°10' N lat. d/	1	75	150	20,000	22,000	14,000	100,000	110,000	50,000	10,000	15,000
	2	100	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	15,000
	3	100	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	15,000
	4	100	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	10,000
	5	75	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	10,000
	6	75	150	20,000	22,000	14,000	100,000	110,000	50,000	10,000	15,000
S 38° N lat. d/	1	75	150	20,000	22,000	14,000	100,000	110,000	50,000	10,000	40,000
	2	100	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	40,000
	3	100	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	40,000
	4	100	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	40,000
	5	75	150	20,000	22,000	14,000	100,000	110,000	30,000	10,000	40,000
	6	75	150	20,000	22,000	14,000	100,000	110,000	50,000	10,000	40,000

a/ Areas shoreward of the RCA north of Cape Alava are closed.
b/ Splitnose rockfish limits equal to slope rockfish limits.
c/ The seaward RCA boundary is modified to include specified petrale sole fishing areas.
d/ Chilipepper rockfish limits using small footropes are 5,000 lbs/2 months in the south.

Table 4-20. The predicted total catch (mt) of target and depleted species in the 2009-10 limited entry trawl fishery north and south of 40°10' N latitude under Rebuilding Alternatives 5a and 5b.

Species	Total Catch (mt) by Area North	South	Total
Canary	12.6	2.7	15.3
POP	83.2	0.0	83.3
Darkblotched	189.8	34.2	224.0
Widow	1.8	5.8	7.6
Bocaccio	-	10.3	10.3
Yelloweye	0.6	0.0	0.7
Cowcod	-	1.0	1.0
Sablefish	2,460.6	614.3	3,074.9
Longspine	445.9	338.7	784.6
Shortspine	859.8	284.0	1,143.8
Dover	9,859.9	2,636.7	12,496.7
Arrowtooth	1,836.4	50.4	1,886.8
Petrale	2,088.0	336.3	2,424.3
Other Flatfish	1,568.2	553.7	2,121.9
Slope Rockfish	91.8	185.4	277.2

Table 4-21. Limited entry trawl trip limits and seasonal RCA configurations designed to optimize 2009 fishing opportunities under the Preferred Rebuilding Alternative.

Subarea	Period	RCA Boundaries (fm) Shoreward a/	RCA Boundaries (fm) Seaward	Sablefish	Longspine	Shortspine	Dover Sole	Other Flatfish	Petrale Sole	Arrowtooth Flounder	Slope Rockfish b/
North Large Footrope	1	75	200 c/	15,000	22,000	14,000	80,000	110,000	50,000	150,000	2,000
	2	75	200	15,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	3	75	150	18,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	4	75	WA/ 200 OR	18,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	5	75	200	18,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	6	75	200 c/	15,000	22,000	14,000	80,000	110,000	50,000	150,000	2,000
North SFFT	1	75	200 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
	2	75	200	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	3	75	150	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	4	75	WA/ 200 OR	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	5	75	200	8,000	3,000	3,000	40,000	90,000	25,000	90,000	2,000
	6	75	200 c/	5,000	3,000	3,000	40,000	90,000	16,000	90,000	2,000
38°-40°10' N lat. d/	1	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	15,000
	2	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	15,000
	3	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	15,000
	4	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	10,000
	5	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	10,000
	6	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	15,000
S 38° N lat. d/	1	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	40,000
	2	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	3	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	4	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	5	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	6	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	40,000

a/ Areas shoreward of the RCA north of Cape Alava are closed.

b/ Splitnose rockfish limits equal to slope rockfish limits.

c/ The seaward RCA boundary is modified to include specified petrale sole fishing areas.

d/ Chilipepper rockfish limits using small footropes are 5,000 lbs/2 months in the south.

Table 4-22. The predicted total catch (mt) of target and depleted species in the 2009 limited entry trawl fishery north and south of 40°10' N latitude under the Council's preferred OYs for depleted species.

Species	Total Catch (mt) by Area North	South	Total
Canary	12.1	2.8	14.9
POP	72.3	0.0	72.3
Darkblotched	165.2	35.7	200.9
Widow	1.6	6.2	7.7
Bocaccio	-	12.3	12.3
Yelloweye	0.6	0.0	0.6
Cowcod	-	1.3	1.3
Sablefish	2,060.1	596.5	2,656.6
Longspine	445.9	338.7	784.6
Shortspine	859.8	284.2	1,144.0
Dover	8,147.0	3,012.3	11,159.2
Arrowtooth	1,836.4	64.0	1,900.4
Petrale	2,088.0	342.6	2,430.6
Other Flatfish	1,568.2	558.5	2,126.7
Slope Rockfish	85.5	185.4	270.9

Table 4-23. Limited entry trawl trip limits and seasonal RCA configurations designed to optimize 2010 fishing opportunities under the Preferred Rebuilding Alternative.

Subarea	Period	RCA Boundaries (fm)		Sablefish	Longspine	Shortspine	Dover Sole	Other Flatfish	Petrale Sole	Arrowtooth Flounder	Slope Rockfish b/
		Shoreward a/	Seaward								
North Large Footrope	1	75	200 c/	15,000	22,000	14,000	80,000	110,000	50,000	150,000	2,000
	2	75	200	15,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	3	60	150	18,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	4	60	WA/ 200 OR	18,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	5	75	200	18,000	22,000	14,000	80,000	110,000	30,000	150,000	2,000
	6	75	200 c/	15,000	22,000	14,000	80,000	110,000	50,000	150,000	2,000
North SFFT	1	75	200 c/	5,000	3,000	3,000	25,000	50,000	16,000	50,000	2,000
	2	75	200	5,000	3,000	3,000	25,000	50,000	16,000	50,000	2,000
	3	60	150	5,000	3,000	3,000	25,000	50,000	16,000	50,000	2,000
	4	60	WA/ 200 OR	5,000	3,000	3,000	25,000	50,000	16,000	50,000	2,000
	5	75	200	5,000	3,000	3,000	25,000	50,000	16,000	50,000	2,000
	6	75	200 c/	5,000	3,000	3,000	25,000	50,000	16,000	50,000	2,000
38°-40°10' N lat. d/	1	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	15,000
	2	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	15,000
	3	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	15,000
	4	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	10,000
	5	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	10,000
	6	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	15,000
S 38° N lat. d/	1	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	40,000
	2	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	3	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	4	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	5	100	150	20,000	22,000	14,000	110,000	110,000	30,000	10,000	40,000
	6	100	150	18,000	22,000	14,000	110,000	110,000	40,000	10,000	40,000

a/ Areas shoreward of the RCA north of Cape Alava are closed.

b/ Splitnose rockfish limits equal to slope rockfish limits.

c/ The seaward RCA boundary is modified to include specified petrale sole fishing areas.

d/ Chilipepper rockfish limits using small footropes are 5,000 lbs/2 months in the south.

Table 4-24. The predicted total catch (mt) of target and depleted species in the 2010 limited entry trawl fishery north and south of 40°10' N latitude under the Council's preferred OYs for depleted species.

Species	Total Catch (mt) by Area		
	North	South	Total
Canary	6.6	2.8	9.3
POP	73.6	0.0	73.6
Darkblotched	166.7	35.7	202.4
Widow	1.6	6.2	7.7
Bocaccio	-	12.3	12.3
Yelloweye	0.3	0.0	0.3
Cowcod	-	1.3	1.3
Sablefish	1,978.2	596.5	2,574.7
Longspine	446.3	338.7	785.1
Shortspine	867.4	284.2	1,151.6
Dover	7,487.4	3,012.3	10,499.7
Arrowtooth	1,411.8	64.0	1,475.8
Petrale	1,976.3	342.6	2,318.9
Other Flatfish	1,496.1	558.5	2,054.6
Slope Rockfish	91.8	185.4	277.2

Limited Entry Whiting Trawl

The Pacific whiting fishery is limited by widow rockfish in all rebuilding species options. This is based on an extension of the linear trend analysis for predicting widow bycatch that the GMT has been using since the start of 2007. Data used to inform this analysis is through 2007, and therefore, the trend is predicting bycatch two years into the future. This creates some substantial uncertainty, so the estimates are best treated as order of magnitude estimates. The implications of this approach means that a widow rockfish OY of 371 mt may limit the whiting fishery to a U.S. OY of slightly under 200,000 mt, while a widow rockfish OY of 522 mt may limit the whiting fishery to a U.S. OY of slightly under 300,000 mt (Table 4-25).

Table 4-25. Predicted impacts of depleted species across a range of whiting OYs.

U.S. OY (mt)	Sector	Sector Allocation	Canary	Darkblotched	POP	Widow	Yelloweye
280,770	Tribal	35,000	1.1	0.0	0.5	2.7	-
	Mothership	58,505	2.2	6.6	1.2	128.7	0.0
	C-P	82,882	0.3	6.5	1.2	157.5	0.0
	Shoreside	102,384	1.7	3.1	0.4	163.8	0.0
	Total	278,770	5.3	16.2	3.3	452.7	0.0
192,014	Tribal	27,500	0.8	0.0	0.4	2.1	-
	Mothership	39,003	1.5	4.4	0.8	85.8	0.0
	C-P	55,255	0.2	4.3	0.8	105.0	0.0
	Shoreside	68,256	1.1	2.0	0.2	109.2	0.0
	Total	190,014	3.6	10.7	2.2	302.1	0.0

Commercial and Recreational Hook-and-Line Fisheries

All the 2009 commercial hook-and-line fisheries (limited entry fixed gear and directed open access), as well as the Washington, Oregon, and California recreational fisheries will be limited by the available yield of yelloweye rockfish and decisions on how to share that available yield. Section 4.5.2 describes the 2009-10 management measure alternatives for each of these sectors in greater detail, as well as the species impacts under each alternative. Table 4-26 provides those sector alternatives that can be accommodated under each rebuilding alternative by catch scenarios based on the 2005 and 2007 bycatch scorecards. *Note: the results under this section are not significantly different than those presented by the GMT in April 2008 under Agenda Item H.7. This section will be completed after the June 2008 Council meeting.*

4.3.2 *Precautionary Zone Groundfish Species*

4.3.2.1 *Blue Rockfish (in Waters off California)*

The first blue rockfish assessment on the West Coast was conducted in 2007 for the portion of the stock occurring in waters off California north of Pt. Conception {Key, *et al.* 2008}. The base model in the assessment estimated spawning stock biomass at 29.7% of initial, unfished biomass in 2007; therefore, the stock is considered in the precautionary zone. There are two 2009-10 OY alternatives that contemplate managing blue rockfish off California with species-specific harvest specifications (OY alternatives 3 and 4) and two OY alternatives that contemplate continuing to manage blue rockfish in the minor nearshore rockfish complexes north and south of 40°10' N latitude (OY alternatives 1 and 2; see section 2.1.4 for a description of these two OY alternatives). All four OY alternatives are based on results from the new assessment.

OY Alternative 3 (207 mt in 2009 and 2010) would apply to the portion of the stock occurring off California and is based on the 40-10 adjusted harvestable yield from the assessment base model using an F50% harvest rate for the assessed portion of the California stock north of Pt. Conception at 34°27' N latitude plus 9 mt for the contribution to the OY south of Pt. Conception. The south of Pt. Conception portion of the OY (9 mt) is a 50% adjustment of the original ABC contribution of blue rockfish to the southern minor nearshore rockfish complex (18 mt), which represents the average 1994-99 harvest of blue rockfish in those waters.

OY Alternative 4 (230 mt in 2009 and 2010) would apply to the portion of the stock occurring off California and is based on setting the north of Pt. Conception OY equal to the ABC using the high productivity model (high natural mortality) from the new assessment as constrained by the base model ABC plus 9 mt for the contribution to the OY south of Pt. Conception. The south of Pt. Conception portion of the OY (9 mt) is a 50% adjustment of the original ABC contribution of blue rockfish to the southern minor nearshore rockfish complex (18 mt), which represents the average 1994-99 harvest of blue rockfish in those waters.

4.3.2.2 *Cabezon (in Waters off California)*

All cabezon (*Scorpaenichthys marmoratus*) OY alternatives are based on the most recent cabezon assessment, which was done for the portion of the stock occurring in waters off California in 2005 (Cope and Punt 2006). The assessment stratified analyses for two substocks, north and south of Pt. Conception at 34°27' N latitude, with an estimated spawning output for the northern California substock of $B_{40.1\%}$ and $B_{28.3\%}$ for the southern California substock. Since the two substocks collectively have an estimated spawning output less than $B_{40\%}$, cabezon in waters off California are considered a precautionary zone stock.

OY Alternative 1 (69 mt in 2009 and 2010) is the status quo OY and is based on the average of the 2007 and 2008 OYs projected in the 2005 assessment using an F50% harvest rate with a 60-20 adjustment. The 60-20 adjustment is analogous to the Council’s default 40-10 rule, where, in this case, the OY equals the ABC at spawning biomasses ≥60% of initial biomass and sequentially reduced from the ABC until, at 20% of initial biomass, the OY is set to zero.

OY Alternative 2 (74 mt in 2009 and 2010) is based on the average of the 2009 and 2010 OYs projected in the 2005 assessment using an F50% harvest rate with the 60-20 adjustment.

The preliminary preferred OY Alternative is OY Alternative 3 (69 mt in 2009 and 79 mt in 2010), which are the year-specific 2009 and 2010 OYs projected in the 2005 assessment using an F50% harvest rate with the 60-20 adjustment.

4.3.2.3 *Petrale Sole*

The most recent petrale sole (*Eopsetta jordani*) assessment was done in 2005 (Lai, *et al.* 2006). The portion of the stock in the northern assessment area (Columbia and U.S.-Vancouver INPFC areas) had an estimated spawning stock biomass of $B_{34\%}$ in 2005 and the portion of the stock in the southern assessment area (Conception, Monterey, and Eureka INPFC areas) had an estimated spawning stock biomass of $B_{29\%}$ in 2005. Since the stock's spawning biomass is less than $B_{40\%}$, this is considered a precautionary zone stock.

Only one alternative OY alternative was considered for petrale sole for 2009-10. The OY was projected from the 2005 assessment using the same methodology as used for the final preferred OY alternative in 2007-08. The 2009-10 OY (2,433 mt in 2009 and 2,393 mt in 2010) is based on the sum of the 40-10 adjusted northern OY and 75% of the 40-10 adjusted southern OY. The southern OY has a 75% precautionary adjustment due to greater assessment uncertainty.

4.3.2.4 *Sablefish*

All 2009-10 sablefish OY alternatives are based on a new assessment of the coastwide stock conducted in 2007 {Schirripa 2008}. While the new assessment indicates stock status has improved since the last assessment in 2005, stock depletion was estimated to be at 38.3% of initial, unfished biomass and still in the precautionary zone. As has been standard practice, all alternatives apportion the coastwide OY north and south of 36° N latitude since all commercial allocations are currently based on the proportion of the harvestable surplus of sablefish north of 36° N latitude.

OY Alternative 1 (9,795 mt coastwide, 9,452 mt north of 36° N latitude, and 343 mt south of 36° N latitude in 2009; and 8,988 mt coastwide, 8,673 mt north of 36° N latitude, and 315 mt south of 36° N latitude in 2010) is based on the 40-10 adjusted yield projected from the base model in the new assessment. The coastwide OY was apportioned north and south of 36° N latitude using the status quo method of applying the average proportion of 2000-01 landings of sablefish north of 36° N latitude (96.5%) and south of 36° N latitude (3.5%).

The preliminary preferred sablefish OY is OY Alternative 2 (8,423 mt coastwide, 7,052 mt north of 36° N latitude, and 1,371 mt south of 36° N latitude in 2009; and 7,729 mt coastwide, 6,471 mt north of 36° N latitude, and 1,258 mt south of 36° N latitude in 2010). OY Alternative 2 is developed starting with the 40-10 adjusted coastwide yield projected from the base model of the new assessment. The coastwide yield is then apportioned north and south of 36° N latitude using the average 2003-06 proportions of the swept-area biomass estimates of sablefish from the NWFSC shelf-slope trawl survey (Table 4-27). The average proportions of sablefish biomass distribution are 72% north of 36° N latitude and 28% in the Conception area south of 36° N latitude. The Conception area OY is then adjusted by 50% to account for greater assessment and survey uncertainty south of 36° N latitude. The northern and southern OYs are then summed to derive the coastwide OY.

Table 4-27. Swept-area sablefish biomass estimates from the NWFSC Shelf-Slope Trawl Survey, 2003-2006.

Year	Sum of Biomass (kg)						
	Vancouver	Columbia	Eureka	Monterey	Conception	Coastwide	Conception %
2003	20,447,961	56,588,162	20,056,170	19,142,018	21,023,894	137,258,205	15%
2004	11,464,607	29,129,020	28,194,388	35,702,436	35,283,014	139,773,464	25%
2005	5,336,756	26,710,615	18,055,534	19,895,829	38,972,171	108,970,905	36%
2006	4,666,495	27,065,009	16,177,190	18,221,394	34,173,714	100,303,804	34%
						2002-06 Average	28%

OY Alternative 3 (6,250 mt coastwide, 5,233 mt north of 36° N latitude, and 1,018 mt south of 36° N latitude in 2009; and 5,777 mt coastwide, 4,837 mt north of 36° N latitude, and 941 mt south of 36° N latitude in 2010) is based on the more conservative low abundance model in the new sablefish assessment with a 40-10 adjustment and the same area apportionment methodology used to derive OY Alternative 2 specifications.

The GMT recommended consideration for the apportionment of the coastwide sablefish biomass north and south of 36° N latitude using the swept-area biomass estimates from the NWFSC trawl survey (Table 4-27) due to concerns that the old apportionment methodology was not based on information related to the biomass distribution. The particularly high northern apportionment under OY Alternative 1 could lead to depletion in the north where the larger fleets targeting sablefish operate. This could lead to a decline in abundance in the north and future hardship for fisheries dependent on this valuable stock. OY alternatives 2 and 3 address the GMT's concern for the northern substock. However, despite a 50% precautionary reduction of the southern OY, the much higher Conception area OY may be a concern since the assessment does not well inform the abundance of the southern substock. The GAP also raised concerns regarding a potentially large effort shift of northern fleets to the Conception area if sablefish trip limits in the south are proportionally increased relative to the change in the OY. The Council want to consider this potential effect in setting the Conception area OY. Concerns of greater fishing pressure in the Conception area can also be addressed in the 2009-10 management measures decision.

4.3.3 Healthy Groundfish Species

4.3.3.1 *Arrowtooth Flounder*

All arrowtooth flounder OY alternatives are based on a new arrowtooth flounder assessment conducted in 2007 {Kaplan and Helser 2008}. The new assessment concluded the West Coast arrowtooth flounder stock was healthy with a spawning biomass estimated at 79% of its initial, unfished biomass in 2007.

OY Alternative 1 (5,245 mt in 2009 and in 2010) for arrowtooth flounder is based on the estimated equilibrium MSY under the proxy SPR harvest rate of F40%.

The preliminary preferred OY Alternative is OY Alternative 2 (11,267 in 2009 and 10,112 mt in 2010), which is based on the estimated ABC for the stock. An OY equal to the ABC is allowed under the FMP for healthy stocks, such as arrowtooth flounder when the spawning biomass is equal to or greater than 40% of its initial, unfished level. The new assessment estimated that the spawning biomass of arrowtooth flounder at the beginning of 2007 was 79% of its initial, unfished level.

These alternative OYs compare to the status quo 2007-08 ABC/OY of 5,800 mt.

4.3.3.2 *Black Rockfish (in Waters off Oregon and California)*

All 2009-10 black rockfish (*Sebastes melanops*) harvest specifications are derived using new 2007 assessments. Assessments for the southern portion of the West Coast black rockfish stock south of Cape Falcon, Oregon {Sampson 2008} and the northern portion of the West Coast black rockfish stock north of Cape Falcon, Oregon {Wallace, *et al.* 2008} were used to derive southern harvest specifications for fisheries off Oregon and California and northern harvest specifications for fisheries off Washington. Both assessments indicate a healthy West Coast black rockfish resource with the portion of the stock south of Cape Falcon estimated to be at 70% of its initial, unfished biomass and the portion of the stock north of Cape Falcon estimated to be at 53.4% of its initial, unfished biomass. This section describes the OY alternatives for the portion of the stock occurring in waters off Oregon and California.

OY Alternative 1 (920 mt in 2009 and 831 mt in 2010) is based on results under the low productivity model in the southern assessment for the portion of the stock south of Cape Falcon. An additional yield for the portion of the stock occurring in Oregon waters north of Cape Falcon is added to the OY using 3% of the northern black rockfish OY from the base model of the northern assessment. The 3% apportionment is based on the estimated proportion of catch from waters off Oregon north of Cape Falcon relative to the entire area between Cape Falcon and the U.S.-Canada border.

The preliminary preferred OY alternative is OY Alternative 2 (1,000 mt in 2009 and 2010). Alternative projections using constant catch scenarios of 800 mt; 1,000 mt; and 1,200 mt were requested by the GMT to better inform a low OY alternative. Of these, the GMT recommended analysis of the 1,000 mt constant catch scenario since projected stock depletion under that scenario was intermediate to the low and base case OY alternatives in the assessment's decision table.

OY Alternative 3 (1,469 mt in 2009 and 1,317 mt in 2010) is based on the medium productivity base case model in the southern assessment with the same apportionment methodology to account for the portion of the stock in Oregon waters north of Cape Falcon as described under OY Alternative 1.

4.3.3.3 *Black Rockfish (in Waters off Washington)*

All 2009-10 black rockfish (*Sebastes melanops*) harvest specifications are derived using new 2007 assessments. Assessments for the southern portion of the West Coast black rockfish stock south of Cape Falcon, Oregon {Sampson 2008} and the northern portion of the West Coast black rockfish stock north of Cape Falcon, Oregon {Wallace, *et al.* 2008} were used to derive southern harvest specifications for fisheries off Oregon and California and northern harvest specifications for fisheries off Washington. Both assessments indicate a healthy West Coast black rockfish resource with the portion of the stock south of Cape Falcon estimated to be at 70% of its initial, unfished biomass and the portion of the stock north of Cape Falcon, Oregon estimated to be at 53.4% of its initial, unfished biomass. This section describes the OY alternatives for the portion of the stock occurring in waters off Washington.

Only one OY alternative is considered for the black rockfish stock occurring in waters off Washington; therefore, OY Alternative 1 (490 mt in 2009 and 464 mt in 2010) is the Council's preliminary preferred OY alternative. This OY is based on the base model from the northern assessment, which assumes medium productivity (natural mortality (M) for males = 0.16 and M for females = 0.24). The OY is reduced by 3% to account for the portion of the assessed northern stock occurring in waters of Oregon north of Cape Falcon.

Only the Washington recreational fishery targets northern black rockfish. It is unlikely the fishery will be constrained by this OY or attain a total catch close to the OY given constraints imposed by canary and yelloweye rockfish. There is little risk of overfishing this stock.

4.3.3.4 *California Scorpionfish*

All 2009-10 California scorpionfish (*Scorpaena guttata*) harvest specifications are based on the only assessment done for this stock in 2005 (Maunder, *et al.* 2006). This assessment indicated the California scorpionfish stock was healthy with an estimated spawning stock biomass of 79.8% of its initial, unfished biomass in 2005.

The California scorpionfish assessment used a recreational catch data stream based upon Commercial Passenger Fishing Vessel (CPFV) logbook data expanded to total recreational catch using a proportion of CPFV to total recreational catch (based upon MRFSS catch history). The SSC approved this assessment with the caveat that the ABC/OY from this assessment could only be related to recreational catch calculated in the same manner as this catch stream. CPFV logbook data, while valuable for stock assessment analyses, are not collected in as timely a manner as needed for inseason monitoring. Consequently, a method was derived with the assistance of the primary stock assessment author to modify the ABC/OY from the assessment so that it could be tracked using CRFS catch estimates. This method takes the recreational portion of the stock assessment ABC/OY, multiplies it by the CPFV proportion calculated from the MRFSS data (53 percent), and then divides it using the proportion of CPFV catch observed in the 2004 CRFS data (88 percent). The stock was pulled from the southern minor nearshore rockfish complex and managed with its own ABC/OY beginning in 2007. Two 2009-10 OY alternatives using projections from the 2005 assessment for California scorpionfish were considered for analysis.

OY Alternative 1 (111 mt in 2009 and 99 mt in 2010) is based on projecting the results of the 2005 assessment modified to incorporate CRFS monitoring data for the CPFV component as described above.

The preliminary preferred OY alternative for California scorpionfish is OY Alternative 2 (175 mt in 2009 and 155 mt in 2010). This OY alternative is the status quo OY and is based on a yield between 137 mt (2007-08 OY as modified by the CPFV modification described above) and 219 mt (2007-08 OY from the base model without the CPFV modification). The 2009 OY under this alternative also equals the projected ABC from the base model in the 2005 assessment. The 2010 OY is limited to the projected 2010 ABC from the base model in the 2005 assessment.

4.3.3.5 *Chilipepper Rockfish*

All 2009-2010 chilipepper rockfish (*Sebastes goodei*) OY alternatives are derived from a new assessment conducted in 2007 {Field 2008}. The 2007 assessment indicated the stock was healthy with a spawning stock biomass estimated to be at 70% of its initial, unfished biomass in 2006.

OY Alternative 1 (2,000 mt in 2009 and 2010) is the status quo 2007-08 OY and was specifically set lower than the estimated ABC, even though the stock was considered healthy, as a precautionary mechanism to be reduce the bycatch of co-occurring bocaccio.

OY Alternative 2 (2,099 mt in 2009 and 2010) is based on the estimated long term equilibrium MSY at an F50% SPR harvest rate from the 2007 assessment.

OY Alternative 3 (3,037 mt in 2009 and 2,576 mt in 2010) is based on the ABC/OY projections from the base model in the 2007 assessment.

The preliminary preferred OY Alternative (2,885 mt in 2009 and 2,447 mt in 2010) is based on the ABC/OY projections from the base model in the 2007 assessment with a 5% reduction to buffer the ABC and thereby reduce potential risk of overfishing.

4.3.3.6 *Dover Sole*

All 2009-10 Dover sole (*Microstomus pacificus*) harvest specifications are derived using projections from the most recent assessment conducted in 2005 (Sampson 2006). The 2005 assessment results indicated the coastwide Dover sole stock was healthy with an estimated spawning stock biomass at 63% of its initial, unfished biomass in 2005.

Only one OY alternative is considered for Dover sole; therefore, OY Alternative 1 (16,500 mt in 2009 and 2010) is the Council's preliminary preferred OY alternative. This OY is the status quo OY and is based on the estimated long term equilibrium MSY at an SPR harvest rate of F40% from the 2005 assessment.

4.3.3.7 *English Sole*

All 2009-10 English sole (*Parophrys vetulus*) harvest specifications are based on a new assessment in 2007 {Stewart 2008c}, which was an update of the last full assessment in 2005 (Stewart 2006). The updated assessment results indicated the stock is healthy with an estimated spawning stock biomass estimated to be at 116% of its initial, unfished biomass in 2007.

Only one OY alternative is considered for English sole; therefore, OY Alternative 1 (14,326 mt in 2009 and 9,745 mt in 2010) is the Council's preliminary preferred OY alternative. This OY is based on the ABC/OY projected from the base model in the 2007 updated assessment.

4.3.3.8 *Lingcod*

All 2009-10 lingcod (*Ophiodon elongatus*) OY alternatives are derived from projections in the most recent assessment done in 2005 (Jagielo and Wallace 2006). The 2005 assessment results indicated the stock was healthy with an estimated coastwide spawning stock biomass estimated to be at 60% of its initial, unfished biomass in 2005.

OY Alternative 1 (5,205 mt in 2009 and 4,785 mt in 2010) is based on sum of the projected ABC/OY from the 2005 assessment for the northern substock (north of 43° N latitude; Columbia and U.S.-Vancouver INPFC areas) and the status quo OY for the southern substock (south of 43° N latitude; Conception, Monterey, and Eureka INPFC areas). The coastwide OY is apportioned north and south of the Oregon-California border at 42° N latitude (4,593 mt in 2009 and 4,173 mt in 2010 for north of 42° N latitude; and 612 mt in 2009 and 2010 for south of 42° N latitude) to derive recreational harvest guidelines in California where relatively lower spawning stock abundance is still a concern (estimated spawning biomass for the southern substock was 24% of its initial, unfished biomass in 2005). The apportionment was done using status quo methodology as follows: the percentage of the 2005-06 OY estimated for the area between 42° and 43° N latitude was derived using the proportional lingcod landings in this area relative to landings further south (107 mt/719 mt) and applied this proportion to the estimated OY south of 43° N latitude to determine an estimated OY for the area between 42° and 43° N latitude. This was added to the projected OY for north of 43° N latitude to determine an appropriate OY for north of 42° N latitude.

The preliminary preferred OY is OY Alternative 2 (5,278 mt in 2009 and 4,829 mt in 2010). This OY alternative is based on the sum of the projected ABC/OY for the northern substock and the projected 40-10 adjusted OY for the southern substock. The 2009-10 coastwide OYs were apportioned north and south of the Oregon-California border using the same methodology described under OY Alternative 1 to derive northern and southern OY components (4,593 mt in 2009 and 4,173 mt in 2010 for north of 42° N latitude; and 685 mt in 2009 and 656 mt in 2010 for south of 42° N latitude).

4.3.3.9 *Longnose Skate*

All 2009-10 longnose skate (*Raja rhina*) OY alternatives are based on a new assessment conducted in 2007 {Gertseva and Schirripa 2008}. The 2007 assessment, which is the first one done for this species on the West Coast, indicated the stock is healthy with an estimated spawning stock biomass of 66% of its initial, unfished biomass in 2007. The Council will decide in June 2008 whether to use the 2007 assessment results to adjust the 2009-10 harvest specifications for the Other Fish complex, which longnose skate was one of the component species, or to establish separate species-specific specifications for longnose skate and adjust the Other Fish specifications accordingly.

OY Alternative 1 (901 mt in 2009 and 902 mt in 2010) is based on the projected OYs from the 2007 assessment using the current estimated exploitation rate.

The preliminary preferred OY alternative for longnose skate is OY Alternative 2 (1,349 mt in 2009 and 2010); although, as stated above, the Council has not decided whether to continue to manage longnose skate separately from the Other Fish complex. This OY alternative is based on a 50% increase in the average landings and discard mortality relative to the base model in the 2007 assessment.

OY Alternative 3 (3,428 mt in 2009 and 3,269 mt in 2010) is based on the ABC/OY projected from the 2007 assessment using the base model and the proxy SPR harvest rate of F45%.

4.3.3.10 *Longspine Thornyhead*

All 2009-10 longspine thornyhead (*Sebastolobus altivelis*) harvest specifications were derived from the most recent assessment done in 2005 (Fay 2006). The results of the 2005 coastwide assessment indicated the longspine thornyhead stock was healthy with an estimated spawning stock biomass at 71% of its initial, unfished biomass in 2005. The Council has managed longspine thornyhead with separate OYs north and south of Pt. Conception at 34°27' N latitude since 2007. The status quo 2007-08 specifications for longspine were an OY of 2,220 mt for north of Pt. Conception and an OY of 476 mt for south of Pt. Conception.

Only one OY alternative is considered for longspine thornyhead; therefore, OY Alternative 1 (north of Pt. Conception: 2,231 mt in 2009 and 2,175 mt in 2010; south of Pt. Conception: 395 mt in 2009 and 385 mt in 2010) is the Council's preliminary preferred OY alternative. This OY alternative is based on projected harvestable yields from the 2005 assessment using status quo methodology for apportioning the coastwide harvestable surplus north and south of Pt. Conception to specify area-specific OYs. The apportionment methodology assumed constant density throughout the Conception area and estimated 79% of the assessed coastwide biomass occurs north of Pt. Conception. The northern OY was then reduced by 25% to account for relatively high assessment uncertainty. The southern OY was reduced by 50% to account for relatively high assessment uncertainty and a paucity of survey data for the Conception area.

4.3.3.11 *Pacific Whiting*

Pacific whiting (*Merluccius productus*) are managed based on an annual assessment prepared jointly by U.S. and Canadian scientists. The most recent assessment, conducted in 2008 {Helser, *et al.* 2008}, estimated the stock's spawning biomass at 42.9% of its unfished spawning biomass at the beginning of 2008 and therefore healthy. Pacific whiting harvest specifications are based on these annual assessments and are only analyzed in this EIS to understand the potential bycatch implications of future whiting fisheries. The 2009 ABC and OY will presumably be considered and adopted by a new international Pacific whiting commission in accordance with the recently ratified Pacific Whiting treaty between the U.S. and Canada. The Council is still anticipated to set annual management measures for Pacific whiting fisheries. The analysis and discussion of the bycatch implications of future whiting fisheries in this EIS will serve to better understand effective management strategies to consider for future whiting fisheries (see section 2.2.3.2 for a description of whiting fishery management measure alternatives). These analyses will also aid the Council in deciding the yields of the most constraining species in whiting-directed fisheries to set-aside when deciding 2009-10 management measures for non-whiting fisheries, which collectively with 2009-10 whiting fisheries, must stay under the OY for these constraining species.

As placeholders, the Council specified a range of U.S. OY alternatives for analysis as follows: OY Alternative 1 (134,773 mt) is an OY half that specified in 2008, OY Alternative 2 (269,545 mt) is the status quo 2008 OY, and OY Alternative 3 (404,318 mt) is 150% of the status quo OY.

4.3.3.12 *Shortbelly Rockfish*

A new shortbelly rockfish (*Sebastes jordani*) was done as an academic exercise in 2007 to understand the potential environmental determinants of fluctuations in the recruitment and abundance of an unexploited rockfish population in the California Current ecosystem {Field, *et al.* 2008}. While the 2007 assessment did not go through the Council's STAR process, it was peer reviewed in a similar process and reviewed by the SSC in 2007 at the request of the SWFSC. The SSC noted the assessment did not fully satisfy the Council terms of reference for groundfish stock assessments. However, they concluded the assessment represents improved knowledge about shortbelly rockfish and might be suitable for management purposes in place of inferences from the hydroacoustic surveys conducted during 1977 and 1980, which formed the basis of the status quo ABC/OY of 13,900 mt. Based on this advice, the Council decided to use the assessment to consider alternative 2009-10 harvest specifications for shortbelly rockfish. The 2007 assessment results indicated the shortbelly stock was healthy with an estimated spawning stock biomass at 67% of its initial, unfished biomass in 2005.

OY Alternative 1 (3,475 mt in 2009 and 2010) is 25% of the status quo ABC/OY. The assessment author advised the Council that the stock would be expected to increase in abundance under this harvest rate.

The preliminary preferred OY alternative is OY Alternative 2 (6,950 mt in 2009 and 2010), which is 50% of the status quo ABC/OY. The assessment author advised the Council that the stock would be expected to remain in its current equilibrium under this harvest rate.

4.3.3.13 *Shortspine Thornyhead*

All 2009-10 shortspine thornyhead (*Sebastolobus alascanus*) harvest specifications were derived from the most recent assessment done in 2005 (Hamel 2006). The results of the 2005 coastwide assessment indicated the shortspine thornyhead stock was healthy with an estimated spawning stock biomass at

62.9% of its initial, unfished biomass in 2005. The Council has managed shortspine thornyhead with separate OYs north and south of Pt. Conception at 34°27' N latitude since 2007. The status quo 2007-08 specifications for shortspine were an OY of 1,634 mt for north of Pt. Conception and an OY of 421 mt for south of Pt. Conception.

Only one OY alternative is considered for shortspine thornyhead; therefore, OY Alternative 1 (north of Pt. Conception: 1,608 mt in 2009 and 1,591 mt in 2010; south of Pt. Conception: 414 mt in 2009 and 410 mt in 2010) is the Council's preliminary preferred OY alternative. This OY alternative is based on projected harvestable yields from the 2005 assessment using status quo methodology for apportioning the coastwide harvestable surplus north and south of Pt. Conception to specify area-specific OYs. The apportionment methodology assumed constant density throughout the Conception area and estimated 66% of the assessed coastwide biomass occurs north of Pt. Conception. The southern OY was reduced by 50% to account for relatively high assessment uncertainty due to a paucity of survey data for the Conception area.

4.3.3.14 *Splitnose Rockfish*

A 1994 splitnose rockfish (*Sebastes diploproa*) assessment (Rogers 1994) forms the basis for status quo and proposed 2009-10 harvest specifications for this stock. As in 2007-08, 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.

The Council chose the status quo harvest specifications of 615 mt and 461 mt as the preliminary preferred 2009-10 ABC and OY, respectively for chilipepper rockfish south of 40°10' N latitude.

4.3.3.15 *Starry Flounder*

All 2009-10 starry flounder (*Platichthys stellatus*) harvest specifications were derived from the most recent assessment done in 2005 (Ralston 2006). The results of the 2005 coastwide assessment indicated the starry flounder stock was healthy with an estimated spawning stock biomass at 44% and 62% of its initial, unfished biomass in Washington-Oregon and California, respectively in 2005. The Council started managing starry flounder with its own ABC/OY separate from the Other Flatfish complex since 2007. The status quo 2007-08 OY for starry flounder was 890 mt.

Only one OY alternative is considered for starry flounder; therefore, OY Alternative 1 (1,004 mt in 2009 and 1,077 mt in 2010) is the Council's preliminary preferred OY alternative. These OYs were projected from the base model in the 2005 assessment with a 25% precautionary reduction since this was considered a data-poor assessment.

4.3.3.16 *Yellowtail Rockfish*

All 2009-10 yellowtail rockfish (*Sebastes flavidus*) harvest specifications were derived from the most recent updated assessment done 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 results of the 2005 updated assessment indicated the yellowtail rockfish stock was healthy with an estimated spawning stock biomass at 55% of its initial, unfished biomass in 2005. The status quo 2007-08 ABC/OY for yellowtail rockfish was 4,548 mt.

Only one OY alternative is considered for yellowtail rockfish; therefore, OY Alternative 1 (4,562 mt in 2009 and 2010) is the Council's preliminary preferred OY alternative. This is the projected ABC/OY from the base model in the 2005 updated assessment.

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

4.3.4.1 *Minor Rockfish South*

All changes to the Minor Rockfish South complex are driven by decisions on how to manage blue rockfish given the new assessment results. Potential changes to complex specifications are described in Chapter 2 and in the section that follows.

Southern Minor Nearshore Rockfish Species

Changes to the southern minor nearshore rockfish OY that are considered in this EIS relate to changes to the blue rockfish contribution to the complex.

OY Alternative 1 (630 mt in 2009 and 2010) contemplates continuing to manage blue rockfish stock within the complex. The OY under this alternative is determined by first subtracting the status quo OY contribution of blue rockfish (116 mt) from the status quo OY of 564 mt. Then the OY contribution of blue rockfish from the new assessment (182 mt for the portion of the assessed stock south of 40°10' N latitude) is added back to derive the 630 mt OY. The blue rockfish OY contribution from the 2007 assessment is based on the OY projected using the base case, medium productivity model.

The preliminary preferred OY alternative for the southern minor nearshore rockfish complex is OY Alternative 2 (650 mt in 2009 and 2010), which contemplates continuing to manage blue rockfish within the complex. The OY adjustment for the complex is the same as described under OY Alternative 1, except the new blue rockfish OY contribution is 202 mt and is based on the projected OY from the high productivity model in the 2007 assessment as capped by the base model ABC.

OY Alternative 3 (448 mt in 2009 and 2010) contemplates removing blue rockfish from the southern minor nearshore rockfish complex and managing blue rockfish under their own harvest specifications. The OY under this alternative is derived by removing the old blue rockfish OY contribution of 116 mt from the status quo OY of 564 mt.

The SSC recommended that species like blue rockfish should be managed "at a level concordant with stock assessments, not based on an assemblage aggregate". OY Alternative 3 would be consistent with that recommendation.

Southern Minor Shelf Rockfish Species

Access to southern shelf species has been substantially limited since the implementation of RCAs in 2003 under permanent regulations to reduce catch of depleted species, particularly bocaccio and canary rockfish. As a result, catch of species in the southern minor shelf rockfish complex has been minimal. The Council identified the status quo OY of 714 mt as the only alternative to be analyzed for this complex during the 2009-10 management cycle and selected this as the final Council-preferred alternative.

Southern Minor Slope Rockfish Species

Access to southern slope rockfish will be partially limited in 2009-10 between 38° and 40°10' N latitude by constraints imposed to quickly rebuild darkblotched rockfish. Since there is no new information available to inform new specifications for the southern minor slope rockfish complex, the Council is recommending the status quo OY of 626 mt for 2009-10.

4.3.4.2 *Minor Rockfish North*

All changes to the Minor Rockfish North complex are driven by decisions on how to manage blue rockfish given the new assessment results. Potential changes to complex specifications are described in Chapter 2 and in the section that follows.

Northern Minor Nearshore Rockfish Species

Changes to the northern minor nearshore rockfish OY that are considered in this EIS relate to changes to the blue rockfish contribution to the complex.

OY Alternative 1 (152 mt in 2009 and 2010) contemplates continuing to manage blue rockfish stock within the complex. The OY under this alternative is determined by first subtracting the status quo OY contribution of blue rockfish (15 mt) from the status quo OY of 142 mt. Then the OY contribution of blue rockfish from the new assessment (25 mt for the portion of the assessed stock north of 40°10' N latitude) is added back to derive the 152 mt OY. The blue rockfish OY contribution from the 2007 assessment is based on the OY projected using the base case, medium productivity model.

The preliminary preferred OY alternative for the northern minor nearshore rockfish complex is OY Alternative 2 (155 mt in 2009 and 2010), which contemplates continuing to manage blue rockfish within the complex. The OY adjustment for the complex is the same as described under OY Alternative 1, except the new blue rockfish OY contribution is 28 mt and is based on the projected OY from the high productivity model in the 2007 assessment as capped by the base model ABC.

OY Alternative 3 (127 mt in 2009 and 2010) contemplates removing blue rockfish from the northern minor nearshore rockfish complex and managing blue rockfish under their own harvest specifications. The OY under this alternative is derived by removing the old blue rockfish OY contribution of 15 mt from the status quo OY of 142 mt.

The SSC recommended that species like blue rockfish should be managed “at a level concordant with stock assessments, not based on an assemblage aggregate”. OY Alternative 3 would be consistent with that recommendation.

Northern Minor Shelf Rockfish Species

Access to northern shelf species has been substantially limited since the implementation of RCAs in 2003 under permanent regulations largely to reduce mortalities of canary and yelloweye rockfish. As a result, catch of species in the Minor Shelf Rockfish North complex has been minimal. The Council identified the status quo OY of 968 mt as the only alternative to be analyzed for this complex during the 2000-10 management cycle and selected this as the final Council-preferred alternative.

Northern Minor Slope Rockfish Species

Impacts of species comprising the northern minor slope rockfish complex are managed through commercial RCAs and trip limits, most notably those management measures specified for the trawl sector where most of the northern slope rockfish species are caught. Trawl trip limits and RCA configurations are based on constraints imposed by the depleted slope species, darkblotched rockfish and Pacific ocean perch. No change from status quo is identified by the Council for analysis; therefore, the status quo alternative for the Minor Slope Rockfish North complex, 1,160 mt, is recommended under the final Council-preferred alternative for 2009-10 (Tables 2-1a and 2-1b).

4.3.4.3 *Pacific Cod*

Pacific cod is a transboundary stock with most of the biomass distributed north of the U.S.-Canada border. They are harvested primarily in the limited entry trawl fishery north of 40°10' N latitude. Pacific cod have never been formally assessed on the U.S. West Coast. The status quo ABC and OY for Pacific cod is recommended for 2007–08 fisheries. The ABC of 3,200 mt is based on historical landings and the OY of 1,600 mt is based on the 50 percent precautionary reduction for unassessed stocks as recommended by Restrepo *et al.* (1998). Prior to 2006, allowable landings of Pacific cod were not limited. Harvests in recent years were under the status quo (and proposed) OY of 1,600 mt, but in 2004, total catch approached this harvest level. Therefore, limited entry trawl and limited entry and open access fixed gear trip limits were specified beginning in period 2 of the 2006 fishery to alleviate potential overfishing concerns. These same harvest specifications and trip limits are recommended for the 2009-10 management period, which should maintain total catches well below the Council-preferred OY.

4.3.4.4 *Other Fish*

Development of Harvest Specifications for the Other Fish Complex

The Other Fish stock complex currently 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 or Pacific flatnose (*Antimora microlepis*), Pacific rattail or Pacific grenadier (*Coryphaenoides acrolepis*), ratfish (*Hydrolagus colliei*), cabezon (*Scorpaenichthys marmoratus*) (north of the California/Oregon border at 42° N latitude), and kelp greenling (*Hexagrammos decagrammus*).

When the Groundfish FMP was first implemented in September 1982, the Other Fish complex also contained arrowtooth flounder (*Atheresthes stomias*), but did not include cabezon or kelp greenling. The species comprising the complex were considered under-harvested or not utilized by the commercial or recreational fishery and were characterized as having "low or no economic value". The 1982 FMP explicitly stated that the decision for annual harvest limits must take into account MSY, the current status of stocks, and environmental conditions. It was also stated in the initial FMP that data were lacking to determine an accurate estimate of MSY for the species in the Other Fish complex. Therefore, the ABC for the Other Fish complex was set at a level that would "minimize disruption of existing fisheries." The original ABC for the complex was 16,000 mt apportioned by INPFC area as follows: 3,000 mt for the U.S-Vancouver area; 7,000 mt for the Columbia area; 2,000 mt for the Eureka area; 2,000 for the Monterey area; and 2,000 mt for the Conception area. The Other Fish OY was non-numerical[2] and defined as "all that are landed under regulations adopted by the Council". Within this management framework, a "point of concern" mechanism was adopted that would require the GMT to evaluate relevant data if an ABC was projected to be exceeded to determine if there are signs of stock "stress". If stock stress was so determined, prescriptive management measures to slow or stop the catch would be recommended. A point of concern mechanism was never triggered for the Other Fish complex because landings never exceeded specified ABCs.

In 1984, the Other Fish ABC was reduced from 16,000 mt to 14,700 mt. The area-specific ABCs were changed from 3,000 mt to 2,500 mt in the U.S.-Vancouver area and from 2,000 mt to 1,200 mt in the Eureka area. Cabezon and kelp greenling were added to the FMP under the Other Fish complex with the implementation of Amendment 1 to the Groundfish FMP in July 1984. The Other Fish ABC of 14,700 mt was not modified as a result of adding these two species. Arrowtooth flounder was removed from the Other Fish complex in 1991 and managed under the Other Flatfish complex specifications. Pacific cod caught south of 43° N latitude were also included in the Other Fish complex for convenience, although only trace amounts of Pacific cod have been caught this far south.

The 14,700 mt ABC for the Other Fish complex was re-specified annually from 1984 through 2004. A new cabezon assessment for the portion of the coastwide population occurring in California waters was conducted in 2004. An ABC of 103 mt was specified for California cabezon in 2005 and 100 mt was accordingly deducted from the Other Fish ABC. An OY of 7,300 mt for the Other Fish complex or half the 14,600 mt ABC was specified in 2005 on a GMT recommendation to take a precautionary approach for this assemblage of unassessed stocks. The 14,600 mt ABC and 7,300 mt OY have been re-specified every year since then.

Considerations for Deciding 2009-10 Harvest Specifications for the Other Fish Complex

A new assessment for longnose skate was conducted in 2007 and recommended by a STAR panel and the Council's SSC for management use. The assessment indicated the stock was at healthy abundance, although it was acknowledged as a data-poor assessment with the major uncertainties being the catch history, since most skates are discarded in trawl fisheries, and the NMFS NWFSC trawl survey catchability coefficient (q). The GMT recommended in November 2007 that longnose skate continue to be managed within the Other Fish complex due to relatively high assessment uncertainty. They recommended the alternative OYs derived from the assessment be used to establish a point of concern for longnose skate. In April 2008, the Council was advised by NOAA General Counsel to establish a harvest guideline if the stock is managed within a complex rather than use the point of concern mechanism, since a point of concern has not been used in groundfish management for many years. The Council decided to adopt a 1,349 mt OY for longnose skate in 2009 and 2010 but deferred a decision on whether to manage this species with its own harvest specifications or within the Other Fish complex until June 2008.

The SSC recommended in April 2008 "that the Council manage fisheries based on stock targets and thresholds that are defined at a level concordant with stock assessments, not based on an assemblage aggregate[3]." Given that harvest specifications for the Other Fish complex were developed by setting ABCs well above the historical catch of all the species in the complex, there is no quantitative basis for the ABC, nor is there a breakdown of ABCs for the species comprising the complex. Furthermore,

2 Numerical OYs were specified as landed catch quotas that required automatic actions to prohibit landings if attained inseason. The only numerical OYs specified in 1982 were those for Pacific whiting, sablefish, widow rockfish, shortbelly rockfish, and Pacific ocean perch.

3 They made this recommendation generally, but specifically recommended species-specific harvest specifications be decided for blue rockfish and longnose skate.

harvest specifications for the complex have not been changed even when significant changes were made to the complex, such as removing arrowtooth flounder.

The alternatives at this point are to recommend the longnose skate ABC and OY and make a reasonable adjustment to the Other Fish specifications or to manage longnose skate within the complex and specify a harvest guideline of 1,349 mt for this species. If the Council were to choose to remove longnose skate from the Other Fish complex, it may make sense to recommend 3,400 mt be removed from the Other Fish ABC to account for the "contribution" of longnose skate to derive a value of 11,200 mt. For consistency, an OY of 5,600 mt might be recommended for the Other Fish complex since the same 50% precautionary reduction to the ABC is recommended for unassessed stocks. This is particularly prudent given that the Other Fish harvest specifications are not based on historical catches, but have been well above historical catches given the original FMP objective to set the ABC at a level to "minimize disruption of existing fisheries."

It should also be noted that catches of species in the Other Fish complex have been well below 5,600 mt and rarely greater than 4,000 mt. However, in 2003, the total catch of Other Fish species was 6,557.9 mt. From the longnose skate assessment, the total catch of longnose skate in 2003 was 1,323 mt. Therefore, in this peak year of catch for species in the Other Fish complex, the catch of species other than longnose skate totaled just over 5,200 mt. In other years, the longnose skate catch has exceeded 2,000 mt.

The decision on how to manage longnose skate should therefore consider prudent measures for longnose skate, as well as the other species comprising the Other Fish complex. Longnose skate management would certainly benefit from a species-specific ABC and OY, since harvests for the species would then be tracked inseason against a biologically based OY. This could also be accomplished with a mandatory sorting requirement for skate species and the addition of these species in the QSM tracking system, even if longnose skate are managed within the Other Fish complex. If the species is managed with its own OY, then this is a quota which would require specific action to stay within the OY. If the species is managed within the Other Fish complex, there needs to be specific actions recommended for premature attainment of the longnose skate harvest guideline. Protection of the species would therefore depend on the effectiveness of the automatic actions, so this detail needs to be deliberated.

The other elasmobranchs in the Other Fish complex (big skate, California skate, spiny dogfish, leopard shark, and soupfin shark) are generally a concern for management given their relatively late maturation and low fecundity. Concerns for species in the Other Fish complex will unlikely be addressed in the short term by any measures considered for the 2009-10 management cycle. The SSC remarked in April 2008 that specifications for the Other Fish complex should be re-evaluated in the next management cycle (for management decision-making in 2011-12) since the current specifications are archaic. While the SSC will generally explore assessment options for groundfish complexes, the GMT should consider alternative catch-based specifications for the Other Fish complex if assessment-based specifications are not developed. There should also be consideration for a 2009 assessment of spiny dogfish, which is a candidate stock for a full assessment. This decision will also be made in June 2008.

4.3.4.5 *Other Flatfish*

For sanddabs and rex sole, the available trawl survey data, along with the sizes of selectivity and maturity leads to the recommendation to continue with a data-moderate OY reduction of 25 percent for calculating the contribution of these species to the Other Flatfish OY. The Council believes that it is reasonable to assume that the stocks are above B_{MSY} based on the survey and fisheries information available for these stocks. This recommendation is consistent with Restrepo *et al.* (1998) recommendations for stocks in a data-poor situation that are not depleted, yet below B_{MSY}. The Council does not have information to conclude that these stocks are below B_{MSY}, but takes this precautionary approach in order to acknowledge a lack of data. The remaining species in the group are also likely to begin reproduction prior to retention by trawl gear, and two of the three states restrict access of trawlers to the primary depth distribution of sand sole, the remaining stock in the complex (other than the starry flounder stock that is recommended for removal from the complex) that contributes the bulk of landings among the remaining species. However, environmental factors, such as estuarine and nearshore water quality, may also play an important role in the current status of sand sole. The GMT believes it prudent to use a 50 percent precautionary reduction when calculating the OY component for these species. Survey and fisheries information on these species is less abundant than on rex sole and sanddabs. Thus, the Council recommendation is to continue to specify a 50 percent OY reduction for these species.

Since there is no new information available to inform new specifications for the Other Flatfish complex, the Council is recommending the status quo specifications for 2009-10.

4.3.5 Non-Groundfish Species

4.3.5.1 *Salmon*

See chapter 5 for a description and analysis of salmon bycatch in groundfish fisheries.

4.3.5.2 *Pacific Halibut*

The Pacific halibut fishery is affected by RCA depth restrictions because commercial halibut fishing is prohibited within the non-trawl RCA. Additionally, the alternative YRCAs under the action alternatives will restrict impacts since yelloweye and Pacific halibut tend to co-occur. Action Alternative 1 would have the least commercial impact on Pacific halibut because the seaward boundary is specified at 150 fm north of 40°10' N latitude; Action Alternative 2 would be intermediate with a seaward boundary at 125 fm in the north; and the greatest impact under Action Alternative 3 and the No Action Alternative with a seaward boundary at 100 fm in the north. The alternative YRCA closures north of 40°10' N latitude will also limit recreational Pacific halibut catch. Under the final Council-preferred alternative, Pacific halibut catch is somewhat greater than under the other action alternatives since the non-trawl RCA is not as extensive and fewer YRCAs are recommended for implementation in 2009-10.

4.3.5.3 *Coastal Pelagic Species*

CPS are taken incidentally in the groundfish fishery. Incidental take is well documented in the at-sea and shorebased whiting fishery. Preliminary data for 2001 indicates approximately 80 mt of squid was incidentally taken in the at-sea whiting fishery through October. There is little information on the incidental take of CPS by the other segments of the fishery; however, given that CPS are not associated with the ocean bottom, the interaction is expected to be minimal.

4.3.5.4 *Highly Migratory Species*

HMS, such as tunas and billfish, are largely pelagic, open ocean species infrequently caught in groundfish directed fisheries. None of the alternatives analyzed should affect HMS species.

4.3.5.5 *Dungeness Crab*

Dungeness crab, which are typically harvested using traps (crab pots), ring nets, by hand (scuba divers), or dip nets, are incidentally taken or harmed unintentionally by groundfish gears. Very little bycatch of rockfish has been noted in pot and trap fisheries, including those targeting Dungeness crab. It is not anticipated this fishery would need to be constrained or modified to rebuild any of the depleted West Coast groundfish species of concern.

One potential consideration in adjusting the trawl RCA to depths shallower than 75 fm during the summer months is that smaller vessels would be forced to fish shoreward of the RCA. Concentrating vessel effort in shallow water affects Dungeness crab in the north because they are less likely to survive discard during their summer molting season.

There may be a need for a section 7 ESA consultation to prosecute 2009-10 Dungeness crab fisheries in waters off California and Oregon due to recent "takes" of humpback whales by float lines in crab and sablefish pot/trap fisheries. See Chapter 5 for more details.

4.3.5.6 *Greenlings (Other than Kelp Greenling), Ocean Whitefish, and California Sheephead*

Greenlings of the genus *Hexagrammos* (except kelp greenling), ocean whitefish, and California sheephead are managed by the state of California. Due to their co-occurrence with groundfish and their popularity as recreational target species, California often takes state regulatory action for these species when recreational fisheries for federal groundfish fisheries are closed or limited. Therefore, any of the groundfish actions anticipated for constraining groundfish species are likely to constrain impacts for these species as well.

4.3.5.7 *Pink Shrimp*

The pink shrimp fishery is managed by the states of Washington, Oregon, and California. The season runs from April 1 through October 31, and pink shrimp may be taken for commercial purposes only by trawl nets or pots. Most of the pink shrimp catch is taken with trawl gear with a minimum mesh size of one inch to three eighths inch between the knots. In some years, prior to finfish excluder requirements, the pink shrimp trawl fishery has accounted for a significant share of canary rockfish incidental catch. Beginning in 2002, finfish excluders in the pink shrimp fisheries were mandatory in California, Oregon, and Washington.

The pink shrimp trawl fishery is exempted from RCA boundaries because of state required bycatch excluders that effectively reduce rockfish bycatch. Other regulatory provisions including groundfish landing restrictions do not differ between the action alternatives, the final Council-preferred alternative, or the No Action alternative.

4.3.5.8 *California Halibut*

California halibut are primarily caught in open access exempt trawl fisheries south of Pt. Arena, California and by the California recreational fishery. Since the advent of depth based management of West Coast groundfish fisheries in late 2002, exempt trawl fisheries have been subject to the depth/area restrictions imposed with the establishment of the trawl RCA. Therefore, in addition to reduced incidental groundfish landing allowances, limited access to traditional commercial fishing areas for California halibut under changing trawl RCA configurations may be a significant impact.

There has been a significant amount of mixed target fishing for groundfish species and California halibut in some exempt trawl trips as evidenced by fish ticket landing receipts. The new mandate requiring VMS on open access vessels intending to land groundfish may reduce the groundfish impacts in the commercial California halibut fishery and, at the very least, will enforce the integrity of the trawl RCA restriction on this fleet.

A significant increase in California halibut impacts is not anticipated under any of the action alternatives analyzed in this EIS.

4.3.5.9 *Ridgeback and Spot Prawns*

The ridgeback prawn fishery is managed by the state of California and is prosecuted using exempted trawl gear under the federal open access regulations. Continuing the exemption to RCA restrictions south of 34°27' N latitude is proposed under the final Council-preferred alternative to allow the ridgeback prawn trawl fishery to operate within the trawl RCA to 100 fm when the shoreward boundary of the trawl RCA is at 75 fm. The ridgeback prawn fishery operates primarily between 35 fm and 90 fm, with an average fishing depth of 75 fm. Trawl log data show that 99 percent of ridgeback prawns are caught in depths of 101 fm or less. Therefore, when the shoreward boundary of the trawl RCA is at 100 fm, the fishery will be able to continue operating over traditional fishing grounds. However, the fishery may be significantly impacted when the shoreward boundary of the trawl RCA is at 75 fm. Trawl data evaluated from 2001 showed that 40 percent of the annual catch occurred in depths of 75 fm to 100 fm. An exemption to the RCA closure between 75 fm and 100 fm will allow the fishery to continue fishing operations in traditional fishing grounds in sandy habitats without impact to the depleted rockfish stocks the RCA is intended to protect.

The spot prawn fishery is managed by the states and, since 2003, only fixed gears (pots and traps) are allowed in the fishery. Prior to 2003, exempt trawls were allowed for targeting spot prawns, but the fishery occurred primarily over rocky substrates and the rockfish bycatch was at times excessive. Therefore, spot prawn trawling was prohibited under state and federal regulations beginning in 2003. None of the actions alternatives analyzed in this EIS are anticipated to significantly impact spot prawns.

4.3.5.10 *Sea Cucumbers*

The sea cucumber fishery is managed by the state of California and is prosecuted using exempted trawl gear under the federal open access regulations. Since the advent of depth based management of West Coast groundfish fisheries in late 2002, exempt trawl fisheries have been subject to the depth/area restrictions imposed with the establishment of the trawl RCA. Therefore, in addition to reduced incidental groundfish landing allowances, limited access to traditional commercial fishing areas for sea cucumbers under changing trawl RCA configurations may be a significant impact.

A significant increase in sea cucumber impacts is not anticipated under any of the action alternatives analyzed in this EIS.

4.4 Discussion of Cumulative Impacts

This section to be completed after the June 2008 Council meeting.

4.4.1 Internal Factors

4.4.2 External Factors

4.5 Summary of Impacts

4.5.1 Documentation of Impact Analysis Modeling

4.5.1.1 *Limited Entry Non-Whiting Trawl*

This section to be completed after the June 2008 Council meeting.

4.5.1.2 *Limited Entry Whiting Trawl*

This section to be completed after the June 2008 Council meeting.

4.5.1.3 *Limited Entry Fixed Gear*

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.

The sablefish OY north of 36° N latitude is apportioned according to the formal intersector allocations shown in Figure 4-12. It is assumed in the analysis that the annual sablefish allocation will be attained by the fixed gear fleets. Fleetwide 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 2002 and has focused on those participating in the limited-entry primary fishery. However, data from those observations in the open access daily-trip-limit sablefish fishery also inform the impact model.

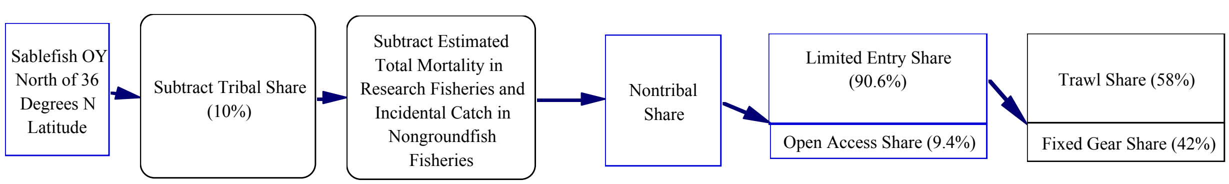


Figure 4-12. The formal intersector allocations of sablefish north of 36° N latitude.

Observations from the fixed gear sablefish fishery north and south of 40°10' N latitude were pooled for all years of data (2002-2006), with no differential weighting applied to catch from different years. This level of data aggregation enables reporting of retained and discarded catch of groundfish species by gear type at a finer latitudinal and depth scale than has been done in previous specifications and management measure analyses. Data summarizing observed retained and discarded catch from fishing efforts north of 40°10' N latitude were stratified by gear type (longline and pot/trap) and three alternative depth ranges that are used to evaluate different seaward boundaries of the non-trawl RCA. Although the range of depths recorded for an individual fixed gear set by observers is commonly much smaller than for observed trawl tows, it may not be possible to accurately assign the catch and discard of many sets to a specific 25 fm interval. For this exercise, the average of the beginning and ending depths of each set was used to represent the depth at which all fish on the set were caught.

The distribution of observed bycatch of canary and yelloweye were evaluated to determine the potential latitudinal boundaries for subareas north of 40°10' N latitude that could be used to segregate areas of higher bycatch of these species and allow for specification of differential seaward RCA boundaries that would promote bycatch reduction with the least disruption of overall fleet fishing practices. This review led to the definition of four subareas for which sablefish catch and discard of other species are summarized. These subareas are bounded by: Cape Mendocino at 40°10' N latitude, the boundary of the Columbia and Eureka INPFC areas (43°10' N latitude), Cascade Head (45.064°10' N latitude), Point Chehalis (46.888°10' N latitude), and the U.S.-Canada border. Several alternative boundaries were evaluated, but those listed above provided the greatest contrast between areas of high and low yelloweye bycatch. In particular, splitting the northernmost subarea, using one of the available management lines, simply created two areas with relatively high yelloweye bycatch from the existing one. Since rockfish bycatch in the pot gear fleet is very small and there are very limited numbers of pot gear observations in some areas, results for this group are summarized with respect to depth only (without subareas).

Tables 4-28, 4-29, and 4-30 report catch and discard data collected from depths greater than 100 fm, 125 fm, and 150 fm, respectively. Discard rates for each subarea and depth are calculated by dividing each discard weight by the weight of retained sablefish, and are provided in Tables 4-31 to 4-33. Since the seaward boundary of the non-trawl RCA south of 40°10' N latitude has always been 150 fm, no data were collected in the sablefish fishery shallower than 150 fm, and hence all of the new columns for each gear type in the southern area contain the same values as reported in the greater than 150 fm depth category.

The highest amounts and rates of yelloweye bycatch in this fishery have been observed north of Point Chehalis. Table 4-34 provides additional information intended to aid the use of these discard rates to project overall northern area impacts associated with implementing differing seaward RCA boundaries across subareas. The upper two panels in Table 4-34 report the distribution of 2002-2006 observed sablefish landings among the four catch subareas and four port groups. The bottom two panels of Table 4-34 report the annual distributions of total fixed-gear sablefish landings (based on fish tickets) among the four port groups. The middle panel of Table 4-34 reports estimates of the distribution of fleet-wide, northern-area landings among catch areas, which area based on the other data presented in Table 4-34. Although the annual results presented in the middle panel are all based on the average port group catch area distributions for the 2002-2006 period, they do illustrate the variability in the proportions of sablefish attributed to each catch area as a result of annual changes in the port groups where sablefish are landed.

In evaluating the overall effect of alternative RCA specifications, a column from Table 4-31, 4-32, or 4-33 may be selected to represent each of the four areas. The discard rates associated with the depth range selected for each area can then be multiplied by the row from the middle panel of Table 4-34 which is judged to be most representative (Tables 4-35 to 4-37). Summing these results across the entire area north of 40°10' N latitude yields weighted-average discard rates that can be used directly in the existing spreadsheet model used to evaluate impacts in this fishery.

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. 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 of sablefish 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 4-28. Amounts of species discard observed on fixed-gear sablefish sets deeper than 100 fm, stratified north and south of 40°10' N latitude, including four subareas for longline catch north of 40°10' N latitude.

	All observations recorded as being deeper than 100 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Observed sablefish pounds								
retained	141,939	2,643,162	379,834	584,656	411,205	1,267,467	207,178	1,548,261
discarded	64,449	357,465	54,360	137,272	79,756	86,078	96,335	319,949
Number of observed sets								
total	138	1,902	222	353	235	1,092	94	1,445
with yelloweye	0	127	7	23	4	93	0	2
% of total	0%	7%	3%	7%	2%	9%	0%	0%
with canary	0	113	5	17	18	73	0	0
% of total	0%	6%	2%	5%	8%	7%	0%	0%
Discarded pounds of species								
Canary rockfish	**0**	**1,166**	**36**	**172**	**120**	**838**	**0**	**0**
Widow rockfish	0	10	0	0	10	0	0	5
Yelloweye rockfish	**0**	**1,741**	**194**	**403**	**68**	**1,075**	**0**	**7**
Bocaccio rockfish	0	0	0	0	0	0	0	0
Cowcod rockfish	0	0	0	0	0	0	0	0
Pacific ocean perch	0	243	14	0	16	213	2	3
Darkblotched rockfish	53	466	211	55	16	183	32	114
Pacific whiting/hake	52	593	118	200	153	122	0	54
Shortspine thornyhead	437	1,752	177	66	312	1,198	1	77
Longspine thornyhead	120	10	0	2	3	5	0	11
Dover sole	519	4,778	125	221	2,507	1,925	63	1,087
Arrowtooth flounder	6	97,097	134	2,745	4,728	89,490	23	2,775
Petrale sole	1	84	0	10	8	66	7	0
English sole	0	0	0	0	0	0	0	0
Other flatfish	0	674	0	597	51	26	0	5
Yellowtail rockfish	0	675	0	0	14	661	0	0
Chilipepper rockfish	0	0	0	0	0	0	0	0
Other shelf rockfish	65	13,237	1,329	931	1,108	9,869	24	103
Blackgill rockfish	569	0	0	0	0	0	69	0
Splitnose rockfish	45	0	0	0	0	0	19	0
Other slope rockfish	2,691	14,920	1,803	794	2,324	9,999	6	137
Lingcod	20	19,276	582	2,709	1,123	14,863	2,736	6,365
Pacific cod	0	3,038	0	22	54	2,962	0	6
Spiny dogfish	6,375	368,177	12,512	6,511	54,529	294,625	6	661
Longnose skate	6,038	87,767	8,478	13,301	12,120	53,867	0	0
Big skate	31	27,649	1,475	579	189	25,406	0	0
Unspecified skate	1,839	41,664	2,550	8,289	6,052	24,775	0	0
Other groundfish	3,536	6,244	2,279	1,155	351	2,460	11	3,761
Pacific Halibut	13	637,029	6,247	69,377	21,263	540,142	0	27,208
Other non-groundfish	7,600	88,593	5,917	19,223	17,013	46,440	32	8,290

Table 4-29. Amounts of species discard observed on fixed-gear sablefish sets deeper than 125 fm, stratified north and south of 40°10' N latitude, including four subareas for longline catch north of 40°10' N latitude.

	All observations recorded as being deeper than 125 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Observed sablefish pounds								
retained	141,939	2,011,574	334,560	442,757	232,204	1,002,053	207,178	1,437,897
discarded	64,449	267,854	50,829	107,519	44,074	65,431	96,335	303,092
Number of observed sets								
total	138	1,423	199	262	161	801	94	1,373
with yelloweye	0	60	5	6	3	46	0	0
% of total	0%	4%	3%	2%	2%	6%	0%	0%
with canary	0	39	2	4	4	29	0	0
% of total	0%	3%	1%	2%	2%	4%	0%	0%
Discarded pounds of species								
Canary rockfish	**0**	**516**	**10**	**99**	**8**	**398**	**0**	**0**
Widow rockfish	0	0	0	0	0	0	0	5
Yelloweye rockfish	**0**	**859**	**178**	**37**	**63**	**583**	**0**	**0**
Bocaccio rockfish	0	0	0	0	0	0	0	0
Cowcod rockfish	0	0	0	0	0	0	0	0
Pacific ocean perch	0	160	0	0	16	144	2	3
Darkblotched rockfish	53	417	184	54	16	163	32	114
Pacific whiting/hake	52	507	118	157	147	85	0	54
Shortspine thornyhead	437	1,643	177	60	288	1,118	1	77
Longspine thornyhead	120	7	0	2	1	3	0	11
Dover sole	519	1,985	113	155	150	1,567	63	1,078
Arrowtooth flounder	6	75,876	79	2,224	4,115	69,458	23	2,714
Petrale sole	1	18	0	3	0	15	7	0
English sole	0	0	0	0	0	0	0	0
Other flatfish	0	542	0	525	0	17	0	5
Yellowtail rockfish	0	430	0	0	0	430	0	0
Chilipepper rockfish	0	0	0	0	0	0	0	0
Other shelf rockfish	65	9,229	1,084	523	497	7,124	24	91
Blackgill rockfish	569	0	0	0	0	0	69	0
Splitnose rockfish	45	0	0	0	0	0	19	0
Other slope rockfish	2,691	14,407	1,792	483	2,258	9,875	6	137
Lingcod	20	11,000	390	2,358	103	8,148	2,736	5,347
Pacific cod	0	1,225	0	0	43	1,182	0	6
Spiny dogfish	6,375	275,549	11,291	3,849	36,518	223,890	6	346
Longnose skate	6,038	64,142	8,107	11,671	5,061	39,302	0	0
Big skate	31	15,814	647	324	89	14,754	0	0
Unspecified skate	1,839	26,404	2,061	5,279	2,601	16,463	0	0
Other groundfish	3,536	5,236	2,167	896	186	1,987	11	3,726
Pacific Halibut	13	385,424	3,653	55,551	14,171	312,049	0	24,242
Other non-groundfish	7,600	61,233	5,618	15,261	6,863	33,491	32	8,063

Table 4-30. Amounts of species discard observed on fixed-gear sablefish sets deeper than 150 fm, stratified north and south of 40°10' N latitude, including four subareas for longline catch north of 40°10' N latitude.

	All observations recorded as being deeper than 150 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Observed sablefish pounds								
retained	141,939	1,400,373	259,771	253,782	153,026	733,794	207,178	1,381,297
discarded	64,449	177,749	44,890	62,210	26,600	44,050	96,335	296,434
Number of observed sets								
total	138	1,026	160	164	117	585	94	1,313
with yelloweye	0	22	1	2	3	16	0	0
% of total	0%	2%	1%	1%	3%	3%	0%	0%
with canary	0	13	0	2	1	10	0	0
% of total	0%	1%	0%	1%	1%	2%	0%	0%
Discarded pounds of species								
Canary rockfish	**0**	**102**	**0**	**49**	**0**	**53**	**0**	**0**
Widow rockfish	0	0	0	0	0	0	0	5
Yelloweye rockfish	**0**	**359**	**8**	**28**	**63**	**261**	**0**	**0**
Bocaccio rockfish	0	0	0	0	0	0	0	0
Cowcod rockfish	0	0	0	0	0	0	0	0
Pacific ocean perch	0	75	0	0	16	59	2	2
Darkblotched rockfish	53	273	94	40	15	124	32	114
Pacific whiting/hake	52	288	42	116	55	74	0	54
Shortspine thornyhead	437	1,396	163	50	209	974	1	77
Longspine thornyhead	120	7	0	2	1	3	0	11
Dover sole	519	1,198	100	99	123	875	63	1,060
Arrowtooth flounder	6	47,968	28	1,150	3,325	43,466	23	2,449
Petrale sole	1	3	0	0	0	3	7	0
English sole	0	0	0	0	0	0	0	0
Other flatfish	0	93	0	76	0	17	0	5
Yellowtail rockfish	0	228	0	0	0	228	0	0
Chilipepper rockfish	0	0	0	0	0	0	0	0
Other shelf rockfish	65	3,537	193	388	263	2,693	24	85
Blackgill rockfish	569	0	0	0	0	0	69	0
Splitnose rockfish	45	0	0	0	0	0	19	0
Other slope rockfish	2,691	13,163	863	477	2,117	9,706	6	132
Lingcod	20	3,869	214	815	68	2,773	2,736	3,762
Pacific cod	0	568	0	0	33	535	0	6
Spiny dogfish	6,375	208,686	9,381	1,971	22,653	174,681	6	311
Longnose skate	6,038	38,710	7,050	4,303	4,058	23,299	0	0
Big skate	31	5,724	10	93	89	5,532	0	0
Unspecified skate	1,839	16,330	1,470	3,851	1,635	9,374	0	0
Other groundfish	3,536	3,985	2,047	439	94	1,405	11	3,694
Pacific Halibut	13	165,671	2,512	11,521	12,098	139,541	0	21,204
Other non-groundfish	7,600	47,383	5,132	9,487	5,673	27,091	32	8,005

Table 4-31. Rates of species discard, relative to retained sablefish, observed on fixed gear sablefish sets deeper than 100 fm, stratified by area.

Species	All observations recorded as being deeper than 100 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Discarded ratios for species, relative to retained sablefish								
Sablefish	45.4%	13.5%	14.3%	23.5%	19.4%	6.8%	46.5%	20.7%
Canary rockfish	**0.000%**	**0.044%**	**0.010%**	**0.029%**	**0.029%**	**0.066%**	**0.000%**	**0.000%**
Widow rockfish	0.000%	0.000%	0.000%	0.000%	0.002%	0.000%	0.000%	0.000%
Yelloweye rockfish	**0.000%**	**0.066%**	**0.051%**	**0.069%**	**0.017%**	**0.085%**	**0.000%**	**0.000%**
Bocaccio rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Cowcod rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Pacific ocean perch	0.000%	0.009%	0.004%	0.000%	0.004%	0.017%	0.001%	0.000%
Darkblotched rockfish	0.038%	0.018%	0.056%	0.009%	0.004%	0.014%	0.016%	0.007%
Pacific whiting/hake	0.036%	0.022%	0.031%	0.034%	0.037%	0.010%	0.000%	0.003%
Shortspine thornyhead	0.308%	0.066%	0.047%	0.011%	0.076%	0.095%	0.000%	0.005%
Longspine thornyhead	0.085%	0.000%	0.000%	0.000%	0.001%	0.000%	0.000%	0.001%
Dover sole	0.365%	0.181%	0.033%	0.038%	0.610%	0.152%	0.030%	0.070%
Arrowtooth flounder	0.004%	3.674%	0.035%	0.470%	1.150%	7.061%	0.011%	0.179%
Petrale sole	0.001%	0.003%	0.000%	0.002%	0.002%	0.005%	0.003%	0.000%
English sole	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other flatfish	0.000%	0.025%	0.000%	0.102%	0.012%	0.002%	0.000%	0.000%
Yellowtail rockfish	0.000%	0.026%	0.000%	0.000%	0.003%	0.052%	0.000%	0.000%
Chilipepper rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other shelf rockfish	0.046%	0.501%	0.350%	0.159%	0.269%	0.779%	0.012%	0.007%
Blackgill rockfish	0.401%	0.000%	0.000%	0.000%	0.000%	0.000%	0.033%	0.000%
Splitnose rockfish	0.032%	0.000%	0.000%	0.000%	0.000%	0.000%	0.009%	0.000%
Other slope rockfish	1.896%	0.564%	0.475%	0.136%	0.565%	0.789%	0.003%	0.009%
Lingcod	0.014%	0.729%	0.153%	0.463%	0.273%	1.173%	1.321%	0.411%
Pacific cod	0.000%	0.115%	0.000%	0.004%	0.013%	0.234%	0.000%	0.000%
Spiny dogfish	4.491%	13.929%	3.294%	1.114%	13.261%	23.245%	0.003%	0.043%
Longnose skate	4.254%	3.321%	2.232%	2.275%	2.948%	4.250%	0.000%	0.000%
Big skate	0.022%	1.046%	0.388%	0.099%	0.046%	2.004%	0.000%	0.000%
Unspecified skate	1.296%	1.576%	0.671%	1.418%	1.472%	1.955%	0.000%	0.000%
Other groundfish	2.491%	0.236%	0.600%	0.198%	0.085%	0.194%	0.005%	0.243%
Pacific Halibut	0.009%	24.101%	1.645%	11.866%	5.171%	42.616%	0.000%	1.757%
Other non-groundfish	5.354%	3.352%	1.558%	3.288%	4.137%	3.664%	0.016%	0.535%

Table 4-32. Rates of species discard, relative to retained sablefish, observed on fixed gear sablefish sets deeper than 125 fm, stratified by area.

Species	All observations recorded as being deeper than 125 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Discarded ratios for species, relative to retained sablefish								
Sablefish	45.4%	13.3%	15.2%	24.3%	19.0%	6.5%	46.5%	21.1%
Canary rockfish	**0.000%**	**0.026%**	**0.003%**	**0.022%**	**0.004%**	**0.040%**	**0.000%**	**0.000%**
Widow rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Yelloweye rockfish	**0.000%**	**0.043%**	**0.053%**	**0.008%**	**0.027%**	**0.058%**	**0.000%**	**0.000%**
Bocaccio rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Cowcod rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Pacific ocean perch	0.000%	0.008%	0.000%	0.000%	0.007%	0.014%	0.001%	0.000%
Darkblotched rockfish	0.038%	0.021%	0.055%	0.012%	0.007%	0.016%	0.016%	0.008%
Pacific whiting/hake	0.036%	0.025%	0.035%	0.035%	0.063%	0.008%	0.000%	0.004%
Shortspine thornyhead	0.308%	0.082%	0.053%	0.014%	0.124%	0.112%	0.000%	0.005%
Longspine thornyhead	0.085%	0.000%	0.000%	0.000%	0.001%	0.000%	0.000%	0.001%
Dover sole	0.365%	0.099%	0.034%	0.035%	0.064%	0.156%	0.030%	0.075%
Arrowtooth flounder	0.004%	3.772%	0.024%	0.502%	1.772%	6.932%	0.011%	0.189%
Petrale sole	0.001%	0.001%	0.000%	0.001%	0.000%	0.001%	0.003%	0.000%
English sole	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other flatfish	0.000%	0.027%	0.000%	0.119%	0.000%	0.002%	0.000%	0.000%
Yellowtail rockfish	0.000%	0.021%	0.000%	0.000%	0.000%	0.043%	0.000%	0.000%
Chilipepper rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other shelf rockfish	0.046%	0.459%	0.324%	0.118%	0.214%	0.711%	0.012%	0.006%
Blackgill rockfish	0.401%	0.000%	0.000%	0.000%	0.000%	0.000%	0.033%	0.000%
Splitnose rockfish	0.032%	0.000%	0.000%	0.000%	0.000%	0.000%	0.009%	0.000%
Other slope rockfish	1.896%	0.716%	0.536%	0.109%	0.972%	0.985%	0.003%	0.010%
Lingcod	0.014%	0.547%	0.117%	0.533%	0.044%	0.813%	1.321%	0.372%
Pacific cod	0.000%	0.061%	0.000%	0.000%	0.019%	0.118%	0.000%	0.000%
Spiny dogfish	4.491%	13.698%	3.375%	0.869%	15.727%	22.343%	0.003%	0.024%
Longnose skate	4.254%	3.189%	2.423%	2.636%	2.180%	3.922%	0.000%	0.000%
Big skate	0.022%	0.786%	0.193%	0.073%	0.038%	1.472%	0.000%	0.000%
Unspecified skate	1.296%	1.313%	0.616%	1.192%	1.120%	1.643%	0.000%	0.000%
Other groundfish	2.491%	0.260%	0.648%	0.202%	0.080%	0.198%	0.005%	0.259%
Pacific Halibut	0.009%	19.160%	1.092%	12.547%	6.103%	31.141%	0.000%	1.686%
Other non-groundfish	5.354%	3.044%	1.679%	3.447%	2.955%	3.342%	0.016%	0.561%

Table 4-33. Rates of species discard, relative to retained sablefish, observed on fixed gear sablefish sets deeper than 150 fm, stratified by area.

Species	All observations recorded as being deeper than 150 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Discarded ratios for species, relative to retained sablefish								
Sablefish	45.4%	12.7%	17.3%	24.5%	17.4%	6.0%	46.5%	21.5%
Canary rockfish	**0.000%**	**0.007%**	**0.000%**	**0.019%**	**0.000%**	**0.007%**	**0.000%**	**0.000%**
Widow rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Yelloweye rockfish	**0.000%**	**0.026%**	**0.003%**	**0.011%**	**0.041%**	**0.036%**	**0.000%**	**0.000%**
Bocaccio rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Cowcod rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Pacific ocean perch	0.000%	0.005%	0.000%	0.000%	0.010%	0.008%	0.001%	0.000%
Darkblotched rockfish	0.038%	0.020%	0.036%	0.016%	0.010%	0.017%	0.016%	0.008%
Pacific whiting/hake	0.036%	0.021%	0.016%	0.046%	0.036%	0.010%	0.000%	0.004%
Shortspine thornyhead	0.308%	0.100%	0.063%	0.020%	0.137%	0.133%	0.000%	0.006%
Longspine thornyhead	0.085%	0.000%	0.000%	0.001%	0.001%	0.000%	0.000%	0.001%
Dover sole	0.365%	0.086%	0.038%	0.039%	0.081%	0.119%	0.030%	0.077%
Arrowtooth flounder	0.004%	3.425%	0.011%	0.453%	2.173%	5.923%	0.011%	0.177%
Petrale sole	0.001%	0.000%	0.000%	0.000%	0.000%	0.000%	0.003%	0.000%
English sole	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other flatfish	0.000%	0.007%	0.000%	0.030%	0.000%	0.002%	0.000%	0.000%
Yellowtail rockfish	0.000%	0.016%	0.000%	0.000%	0.000%	0.031%	0.000%	0.000%
Chilipepper rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other shelf rockfish	0.046%	0.253%	0.074%	0.153%	0.172%	0.367%	0.012%	0.006%
Blackgill rockfish	0.401%	0.000%	0.000%	0.000%	0.000%	0.000%	0.033%	0.000%
Splitnose rockfish	0.032%	0.000%	0.000%	0.000%	0.000%	0.000%	0.009%	0.000%
Other slope rockfish	1.896%	0.940%	0.332%	0.188%	1.384%	1.323%	0.003%	0.010%
Lingcod	0.014%	0.276%	0.082%	0.321%	0.044%	0.378%	1.321%	0.272%
Pacific cod	0.000%	0.041%	0.000%	0.000%	0.021%	0.073%	0.000%	0.000%
Spiny dogfish	4.491%	14.902%	3.611%	0.777%	14.804%	23.805%	0.003%	0.023%
Longnose skate	4.254%	2.764%	2.714%	1.696%	2.652%	3.175%	0.000%	0.000%
Big skate	0.022%	0.409%	0.004%	0.037%	0.058%	0.754%	0.000%	0.000%
Unspecified skate	1.296%	1.166%	0.566%	1.518%	1.068%	1.277%	0.000%	0.000%
Other groundfish	2.491%	0.285%	0.788%	0.173%	0.061%	0.191%	0.005%	0.267%
Pacific Halibut	0.009%	11.831%	0.967%	4.540%	7.906%	19.016%	0.000%	1.535%
Other non-groundfish	5.354%	3.384%	1.976%	3.738%	3.707%	3.692%	0.016%	0.580%

Table 4-34. Apportionment of observed and fleet longline landings of sablefish among port groups and catch areas.

Port group	Longline				
	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	North of 40°10' N lat
Observed sablefish poundage, by area of catch and port group of landing, 2002-2006					
Westport and north	0	22,994	69,517	1,248,592	1,341,104
Astoria and SW Wash.	0	106,394	293,232	18,875	418,500
Coos Bay to Tillamook	23,287	417,946	48,456	0	489,689
Eureka to Bandon	270,610	35,544	0	0	306,155
Percentage of observed port-group sablefish landings attributable to each catch area, 2002-2006					
Westport and north	0.0%	1.7%	5.2%	93.1%	100.0%
Astoria and SW Wash.	0.0%	25.4%	70.1%	4.5%	100.0%
Coos Bay to Tillamook	4.8%	85.3%	9.9%	0.0%	100.0%
Eureka to Bandon	88.4%	11.6%	0.0%	0.0%	100.0%
Estimated distribution of fleet-wide northern longline landings among catch areas, by year (for use in weighting Table 4-31, 4-32, or 4-33 discard rates to obtain northern area weighted averages)					
2002	18%	21%	12%	49%	100%
2003	21%	24%	10%	45%	100%
2004	14%	22%	13%	51%	100%
2005	22%	23%	13%	41%	100%
2006	22%	23%	13%	42%	100%
2002-2006	20%	23%	12%	45%	100%
Distribution of longline fleet landings of sablefish among port groups by year, 2002-2006					
	2002	2003	2004	2005	2006
Metric tons					
Westport and north	484	616	792	780	747
Astoria and SW Wash.	102	97	172	224	220
Coos Bay to Tillamook	161	273	280	348	309
Eureka to Bandon	185	287	214	422	395
North of 40°10'	932	1,274	1,457	1,774	1,671
Port group percentage					
Westport and north	52%	48%	54%	44%	45%
Astoria and SW Wash.	11%	8%	12%	13%	13%
Coos Bay to Tillamook	17%	21%	19%	20%	18%
Eureka to Bandon	20%	23%	15%	24%	24%

Table 4-35. Rates of species discard, relative to retained sablefish, weighted by the 2002-06 average estimated distribution of fleetwide northern longline landings among catch areas north of 40°10' N latitude, observed on fixed-gear sablefish sets deeper than 100 fm, stratified by area. Discard rates north of 40°10' N latitude are the sum of the northern subareas. Discard rates south of 40°10' N latitude are the same as in Table 4-31.

Species	All observations recorded as being deeper than 100 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Discarded ratios for species, relative to retained sablefish								
Sablefish	45.4%	13.6%	2.8%	5.3%	2.4%	3.1%	46.5%	20.7%
Canary rockfish	**0.000%**	**0.042%**	**0.002%**	**0.007%**	**0.004%**	**0.030%**	**0.000%**	**0.000%**
Widow rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Yelloweye rockfish	**0.000%**	**0.066%**	**0.010%**	**0.016%**	**0.002%**	**0.038%**	**0.000%**	**0.000%**
Bocaccio rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Cowcod rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Pacific ocean perch	0.000%	0.009%	0.001%	0.000%	0.000%	0.008%	0.001%	0.000%
Darkblotched rockfish	0.038%	0.020%	0.011%	0.002%	0.000%	0.007%	0.016%	0.007%
Pacific whiting/hake	0.036%	0.023%	0.006%	0.008%	0.005%	0.004%	0.000%	0.003%
Shortspine thornyhead	0.308%	0.064%	0.009%	0.003%	0.009%	0.043%	0.000%	0.005%
Longspine thornyhead	0.085%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.001%
Dover sole	0.365%	0.160%	0.006%	0.009%	0.076%	0.069%	0.030%	0.070%
Arrowtooth flounder	0.004%	3.454%	0.007%	0.106%	0.143%	3.198%	0.011%	0.179%
Petrale sole	0.001%	0.003%	0.000%	0.000%	0.000%	0.002%	0.003%	0.000%
English sole	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other flatfish	0.000%	0.026%	0.000%	0.023%	0.002%	0.001%	0.000%	0.000%
Yellowtail rockfish	0.000%	0.024%	0.000%	0.000%	0.000%	0.024%	0.000%	0.000%
Chilipepper rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other shelf rockfish	0.046%	0.491%	0.069%	0.036%	0.034%	0.353%	0.012%	0.007%
Blackgill rockfish	0.401%	0.000%	0.000%	0.000%	0.000%	0.000%	0.033%	0.000%
Splitnose rockfish	0.032%	0.000%	0.000%	0.000%	0.000%	0.000%	0.009%	0.000%
Other slope rockfish	1.896%	0.551%	0.093%	0.031%	0.070%	0.357%	0.003%	0.009%
Lingcod	0.014%	0.700%	0.030%	0.105%	0.034%	0.531%	1.321%	0.411%
Pacific cod	0.000%	0.108%	0.000%	0.001%	0.002%	0.106%	0.000%	0.000%
Spiny dogfish	4.491%	13.076%	0.646%	0.252%	1.649%	10.529%	0.003%	0.043%
Longnose skate	4.254%	3.245%	0.437%	0.516%	0.367%	1.925%	0.000%	0.000%
Big skate	0.022%	1.012%	0.076%	0.022%	0.006%	0.908%	0.000%	0.000%
Unspecified skate	1.296%	1.521%	0.132%	0.321%	0.183%	0.885%	0.000%	0.000%
Other groundfish	2.491%	0.261%	0.118%	0.045%	0.011%	0.088%	0.005%	0.243%
Pacific Halibut	0.009%	22.959%	0.322%	2.690%	0.643%	19.303%	0.000%	1.757%
Other non-groundfish	5.354%	3.225%	0.305%	0.745%	0.515%	1.660%	0.016%	0.535%

Table 4-36. Rates of species discard, relative to retained sablefish, weighted by the 2002-06 average estimated distribution of fleetwide northern longline landings among catch areas north of 40°10' N latitude, observed on fixed-gear sablefish sets deeper than 125 fm, stratified by area. Discard rates north of 40°10' N latitude are the sum of the northern subareas. Discard rates south of 40°10' N latitude are the same as in Table 4-32.

Species	All observations recorded as being deeper than 125 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Discarded ratios for species, relative to retained sablefish								
Sablefish	45.4%	13.8%	3.0%	5.5%	2.4%	3.0%	46.5%	21.1%
Canary rockfish	**0.000%**	**0.024%**	**0.001%**	**0.005%**	**0.000%**	**0.018%**	**0.000%**	**0.000%**
Widow rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Yelloweye rockfish	**0.000%**	**0.042%**	**0.010%**	**0.002%**	**0.003%**	**0.026%**	**0.000%**	**0.000%**
Bocaccio rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Cowcod rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Pacific ocean perch	0.000%	0.007%	0.000%	0.000%	0.001%	0.007%	0.001%	0.000%
Darkblotched rockfish	0.038%	0.022%	0.011%	0.003%	0.001%	0.007%	0.016%	0.008%
Pacific whiting/hake	0.036%	0.027%	0.007%	0.008%	0.008%	0.004%	0.000%	0.004%
Shortspine thornyhead	0.308%	0.079%	0.010%	0.003%	0.015%	0.051%	0.000%	0.005%
Longspine thornyhead	0.085%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.001%
Dover sole	0.365%	0.093%	0.007%	0.008%	0.008%	0.071%	0.030%	0.075%
Arrowtooth flounder	0.004%	3.479%	0.005%	0.114%	0.220%	3.140%	0.011%	0.189%
Petrale sole	0.001%	0.001%	0.000%	0.000%	0.000%	0.001%	0.003%	0.000%
English sole	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other flatfish	0.000%	0.028%	0.000%	0.027%	0.000%	0.001%	0.000%	0.000%
Yellowtail rockfish	0.000%	0.019%	0.000%	0.000%	0.000%	0.019%	0.000%	0.000%
Chilipepper rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other shelf rockfish	0.046%	0.439%	0.064%	0.027%	0.027%	0.322%	0.012%	0.006%
Blackgill rockfish	0.401%	0.000%	0.000%	0.000%	0.000%	0.000%	0.033%	0.000%
Splitnose rockfish	0.032%	0.000%	0.000%	0.000%	0.000%	0.000%	0.009%	0.000%
Other slope rockfish	1.896%	0.697%	0.105%	0.025%	0.121%	0.446%	0.003%	0.010%
Lingcod	0.014%	0.517%	0.023%	0.121%	0.006%	0.368%	1.321%	0.372%
Pacific cod	0.000%	0.056%	0.000%	0.000%	0.002%	0.053%	0.000%	0.000%
Spiny dogfish	4.491%	12.935%	0.661%	0.197%	1.956%	10.120%	0.003%	0.024%
Longnose skate	4.254%	3.120%	0.475%	0.598%	0.271%	1.777%	0.000%	0.000%
Big skate	0.022%	0.726%	0.038%	0.017%	0.005%	0.667%	0.000%	0.000%
Unspecified skate	1.296%	1.275%	0.121%	0.270%	0.139%	0.744%	0.000%	0.000%
Other groundfish	2.491%	0.273%	0.127%	0.046%	0.010%	0.090%	0.005%	0.259%
Pacific Halibut	0.009%	17.923%	0.214%	2.844%	0.759%	14.105%	0.000%	1.686%
Other non-groundfish	5.354%	2.992%	0.329%	0.781%	0.368%	1.514%	0.016%	0.561%

Table 4-37. Rates of species discard, relative to retained sablefish, weighted by the 2002-06 average estimated distribution of fleetwide northern longline landings among catch areas north of 40°10' N latitude, observed on fixed-gear sablefish sets deeper than 150 fm, stratified by area. Discard rates north of 40°10' N latitude are the sum of the northern subareas. Discard rates south of 40°10' N latitude are the same as in Table 4-33.

Species	All observations recorded as being deeper than 150 fm							
	Longline						Pot	
	36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat
Discarded ratios for species, relative to retained sablefish								
Sablefish	45.4%	12.7%	3.4%	5.6%	2.2%	2.7%	46.5%	21.5%
Canary rockfish	**0.000%**	**0.007%**	**0.000%**	**0.004%**	**0.000%**	**0.003%**	**0.000%**	**0.000%**
Widow rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Yelloweye rockfish	**0.000%**	**0.026%**	**0.001%**	**0.003%**	**0.005%**	**0.016%**	**0.000%**	**0.000%**
Bocaccio rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Cowcod rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Pacific ocean perch	0.000%	0.005%	0.000%	0.000%	0.001%	0.004%	0.001%	0.000%
Darkblotched rockfish	0.000%	0.020%	0.007%	0.004%	0.001%	0.008%	0.016%	0.008%
Pacific whiting/hake	0.000%	0.021%	0.003%	0.010%	0.004%	0.005%	0.000%	0.004%
Shortspine thornyhead	0.000%	0.100%	0.012%	0.004%	0.017%	0.060%	0.000%	0.006%
Longspine thornyhead	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.001%
Dover sole	0.000%	0.086%	0.008%	0.009%	0.010%	0.054%	0.030%	0.077%
Arrowtooth flounder	0.000%	3.425%	0.002%	0.103%	0.270%	2.683%	0.011%	0.177%
Petrale sole	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.003%	0.000%
English sole	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other flatfish	0.000%	0.007%	0.000%	0.007%	0.000%	0.001%	0.000%	0.000%
Yellowtail rockfish	0.000%	0.016%	0.000%	0.000%	0.000%	0.014%	0.000%	0.000%
Chilipepper rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Other shelf rockfish	0.000%	0.253%	0.015%	0.035%	0.021%	0.166%	0.012%	0.006%
Blackgill rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.033%	0.000%
Splitnose rockfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.009%	0.000%
Other slope rockfish	0.000%	0.940%	0.065%	0.043%	0.172%	0.599%	0.003%	0.010%
Lingcod	0.000%	0.276%	0.016%	0.073%	0.006%	0.171%	1.321%	0.272%
Pacific cod	0.000%	0.041%	0.000%	0.000%	0.003%	0.033%	0.000%	0.000%
Spiny dogfish	0.000%	14.902%	0.708%	0.176%	1.841%	10.783%	0.003%	0.023%
Longnose skate	0.000%	2.764%	0.532%	0.384%	0.330%	1.438%	0.000%	0.000%
Big skate	0.000%	0.409%	0.001%	0.008%	0.007%	0.341%	0.000%	0.000%
Unspecified skate	0.000%	1.166%	0.111%	0.344%	0.133%	0.579%	0.000%	0.000%
Other groundfish	0.000%	0.285%	0.154%	0.039%	0.008%	0.087%	0.005%	0.267%
Pacific Halibut	0.000%	11.831%	0.189%	1.029%	0.983%	8.614%	0.000%	1.535%
Other non-groundfish	0.000%	3.384%	0.387%	0.847%	0.461%	1.672%	0.016%	0.580%

4.5.1.4 *Directed Open Access*

Impacts associated with the directed open access daily-trip-limit fishery targeting sablefish are modeled using the primary sablefish model described above. Nearshore commercial fisheries in waters off Oregon and California are modeled separately from offshore efforts targeting sablefish.

Bycatch impacts in the open access daily-trip-limit (DTL) sablefish fishery are modeled using the limited entry fixed gear impact model. It is assumed that the directed open access sector will take their entire allocation of sablefish (Figure 4-12). The discard rates used to model bycatch impacts in the primary limited entry fixed sablefish gear fishery are also assumed in the analysis of impacts in the open access DTL fishery. The data informing the fixed gear sablefish bycatch impact model are aggregated across the limited entry and open access fixed gear fleets

Catch and discard data collected between January 1, 2003 through December 31, 2006 from fixed gear fishing conducted in depths less than 50 fm were aggregated by area (north or south of 40°10' N latitude), depth interval, and species or species group, with no inter-annual weighting. Amounts of catch and discard are reported for each of the three depth intervals (0-10 fm, 11-20 fm, and 21-50 fm) used to model impacts in nearshore commercial fisheries and are included in Table 4-38, along with the percentage of each species' (or group's) catch that was discarded. Additionally, a rate of discard relative to the amount of retained nearshore target species in the stratum is reported for species modeled by the GMT as bycatch species: bocaccio, canary rockfish, widow rockfish, yelloweye rockfish, yellowtail rockfish, minor shelf rockfish. For this summary, blue rockfish and black rockfish are not grouped with the target category for deeper nearshore rockfish species in the area south of 40°10' N latitude. The average of gear set and retrieval depths recorded by observers is used to assign each record (gear set) to a depth category. Because many of these observations reflect the practice of drifting while pole gear is deployed, and the fact that the depth intervals are relatively small, the average depth may not always reflect the depth interval in which all or any fish were caught.

Table 4-38. Summary of observed catch and discard of important groundfish species or species groups in nearshore, fixed gear fisheries conducted from January 2003 through December 2006.

Species	0 - 10 fm				11 - 20 fm				21 - 50 fm			
	Observed lbs.		Discard	Discard	Observed lbs.		Discard	Discard	Observed lbs.		Discard	Discard
	Catch	Discard	% a/	Rate b/	Catch	Discard	% a/	Rate b/	Catch	Discard	% a/	Rate b/
North of 40°10' N lat												
Black rockfish	51,777	1,446	2.79%		47,163	1,640	3.48%		2,555	31	1.20%	
Blue rockfish	6,028	1,151	19.09%		11,219	2,120	18.90%		1,555	161	10.33%	
Other minor nearshore rockfish	3,892	153	3.92%		6,675	201	3.01%		2,053	40	1.97%	
Cabezon	4,787	754	15.75%		11,553	1,237	10.71%		482	50	10.47%	
Kelp greenling	4,377	710	16.21%		5,839	1,144	19.59%		223	57	25.54%	
Lingcod	12,161	5,559	45.71%		19,992	8,224	41.14%		3,246	469	14.44%	
Sum of target species	83,021	9,772	11.77%		102,439	14,565	14.22%		10,115	808	7.99%	
Canary rockfish	301	301	100.00%	0.41%	927	924	99.76%	1.05%	290	290	100.00%	3.12%
Widow rockfish	4	0	0.00%	0.00%	74	22	29.13%	0.02%	17	7	39.09%	0.07%
Yelloweye rockfish	82	82	100.00%	0.11%	451	450	99.60%	0.51%	411	411	100.00%	4.41%
Yellowtail rockfish	230	73	31.52%	0.10%	617	243	39.34%	0.28%	278	49	17.67%	0.53%
Minor Shelf rockfish	812	61	7.49%	0.08%	1,811	70	3.86%	0.08%	490	22	4.47%	0.24%
South of 40°10' N lat												
Shallow nearshore rockfish	6,491	1,388	21.39%		2,053	785	38.25%		370	112	30.34%	
Black rockfish	604	126	20.81%		728	166	22.75%		3	3	100.00%	
Blue rockfish	1,073	368	34.36%		1,096	579	52.83%		386	348	90.14%	
Other deeper nearshore rockfish	3,217	259	8.04%		4,926	351	7.12%		269	56	20.77%	
Cabezon	13,585	4,273	31.46%		568	415	73.18%		165	42	25.34%	
Kelp greenling	1,877	1,156	61.58%		150	139	92.34%		111	111	100.00%	
Lingcod	6,472	2,864	44.25%		4,169	2,017	48.38%		396	164	41.52%	
California sheephead	26,039	9,043	34.73%		0	0			0	0		
Sum of target species	59,357	19,477	32.81%		13,691	4,452	32.52%		1,700	837	49.23%	
Bocaccio					4	3	76.47%	0.04%	77	2	2.91%	0.26%
Canary rockfish	23	23	100.00%	0.06%	413	413	100.00%	4.47%	101	101	100.00%	11.71%
Widow rockfish					2	1	26.09%	0.01%				
Yelloweye rockfish					10	10	100.00%	0.10%	12	12	100.00%	1.36%
Minor Shelf rockfish	615	51	8.29%	0.13%	1,331	39	2.93%	0.42%	1,026	51	4.99%	5.93%

[a/] The discard percentage is calculated as the observed discard pounds divided by the observed total catch for each species or species group.

[b/] The discard rate for bycatch species is calculated as the observed discard pounds for a species/group divided by the observed landed catch of all target species combined.

Description of the Open Access Sablefish Daily Trip Limit Fishery Regression Model Used for Inseason Adjustments of Trip Limits

The open access sablefish daily trip limit (DTL) model can be described as the product of two multivariable linear regressions. These regressions predict number of vessels landing open access sablefish in a two-month period and average catch per vessel in a two-month period. The explanatory variables in each regression are: season; the daily limit; the weekly limit; and the monthly limit.

The seasonality variable is included because it appears that fishing effort and success is determined to a large degree by weather. This variable is constructed by assuming that period 4 is the period of highest effort and catch (all else being equal), and that catch and effort decline in a linear fashion if one goes earlier or later in the year. This approach means (if everything else is equal) that period 3 and 5 would be the second highest period of catch and effort, period 2 and 6 would be the third highest period of catch and effort, and period 1 would be the period of lowest catch and effort. This approach essentially creates a triangular distribution between average vessel catch and season.

The daily, weekly, and bimonthly limits are included in the model because these limits directly affect the opportunities available to harvesters. Changes in fishing opportunities in an open access fishery should be expected to change effort in the fishery. In addition, changes in fishing opportunities should also be expected to change the average catch per vessel.

Season and historic DTL regulations on historic levels of effort and on average vessel catch were regressed to construct this model. Daily, weekly, and bimonthly limits for each two month period from 2003 through 2007 were used in the regression analysis. Figure 4-13 shows the accuracy of using the models to predict average catch and effort relative to what actually occurred.

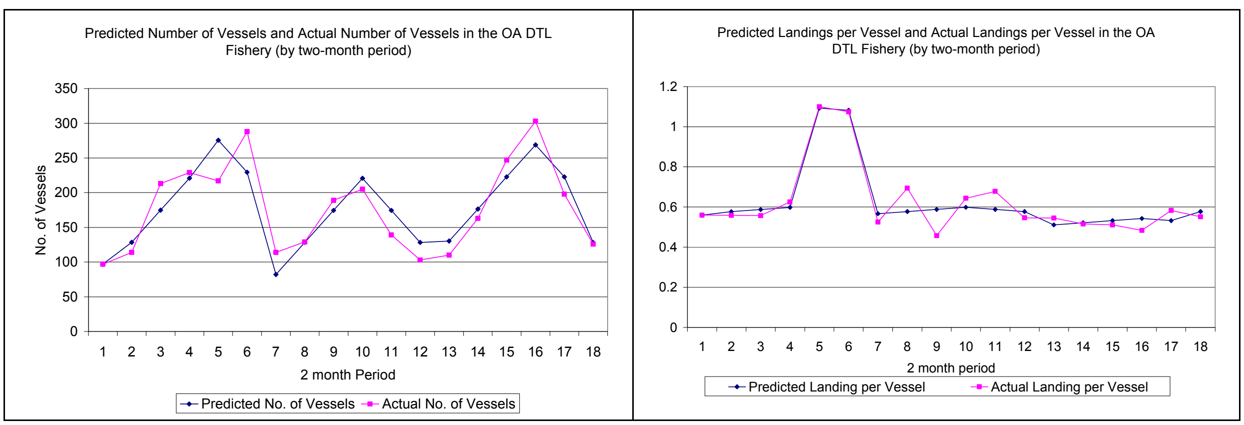


Figure 4-13. Predicted number of vessels versus the actual number of vessels (A) and predicted landings per vessel versus actual landings per vessel (B) in the open access daily-trip-limit fishery by two month period.

By multiplying each of these models by one another we can predict aggregate landings in this fishery for a year or for a given two-month period. Figure 4-14 shows the accuracy of this approach for predicting aggregate landings in this fishery.

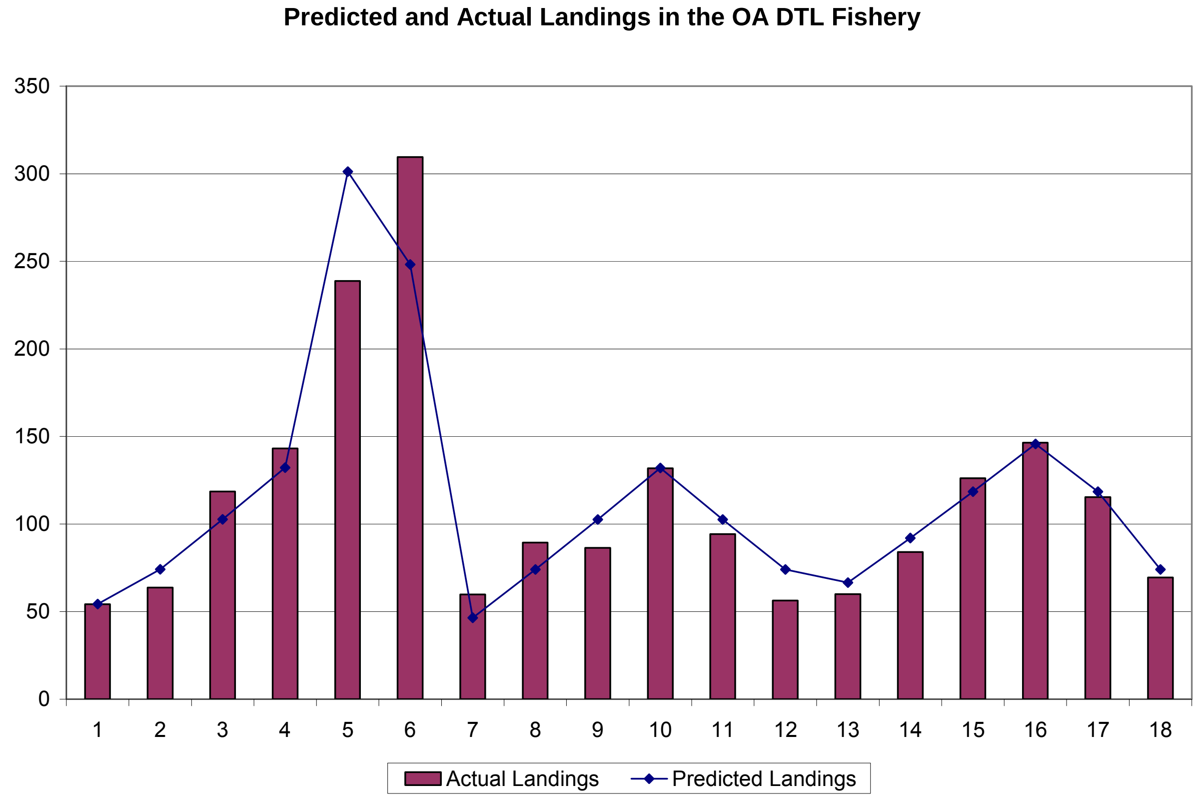


Figure 4-14. Predicted versus actual landings in the open access daily-trip-limit fishery.

Tables 4-39 and 4-40 show the statistical results of each regression. These results show that both models have a high degree of "fit" to the actual data, but some of the parameters are unexpected. In particular, the fact that the weekly limit has a negative coefficient (in the effort model) is unexpected since an increase in fishing opportunity should be expected to result in an increase in effort. A more in-depth look at the information shows that this unexpected sign can be explained because of the high degree of correlation between the weekly limit and the 2-month limit (Pearson correlation = 0.99). In other words, management has historically varied the 2-month limit and the weekly limit in concert, and therefore the regression technique cannot easily untangle the effect of the weekly limit from the 2-month limit on effort. This has implications for possible future management approaches if there is a potential for the weekly and 2-month limit to diverge. If these two limits diverge, the model's capacity to estimate catch levels will almost certainly be diminished.

Table 4-39. Statistical results for the catch per vessel regression analysis.

Regression Statistics				
Multiple R	0.947096565			
R Square	0.896991904			
Adjusted R Square	0.875531884			
Standard Error	0.112296262			
Observations	30			
ANOVA				
	df	*SS*	*MS*	*F*
Regression	5	2.635475653	0.527095131	41.79828
Residual	24	0.302650813	0.012610451	
Total	29	2.938126466		
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.130945908	0.133635926	0.979870548	0.3369
Bad Slmn opp	-0.03110317	0.081522276	-0.38152964	0.7062
minus peak (period)	-0.00198886	0.022626666	-0.08789879	0.9307
day	0.000195027	0.001399768	0.139328226	0.8904
2 month	0.000150027	2.79878E-05	5.36045618	0.0000
week	0.000116645	0.000470168	0.248091019	0.8062

Table 4-40. Statistical results for the number of vessels regression analysis.

Regression Statistics				
Multiple R	0.921265839			
R Square	0.848730747			
Adjusted R Square	0.824527666			
Standard Error	22.0232807			
Observations	30			
ANOVA				
	df	*SS*	*MS*	*F*
Regression	4	68033.57768	17008	35.06705
Residual	25	12125.62232	485	
Total	29	80159.2		
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	19.24193388	25.81139002	0.745	0.4629
Bad Slmn opp	62.35301892	11.48884052	5.427	0.0000
minus peak (period)	34.68262233	4.436273736	7.818	0.0000
day	0.556008406	0.116219706	4.784	0.0001
2 month	-0.00933888	0.004831928	-1.933	0.0647

4.5.1.5 *Tribal*

This section to be completed after the June 2008 Council meeting.

4.5.1.6 *Recreational Discard Mortality*

In June 2007, the Council endorsed the RecFIN Technical Committee's recommendation to apply mortality rates by species and depth to the estimates of total discards in order to estimate total mortalities for discarded fish. This method of accounting for discards is intended to assure that discard mortalities are determined in a consistent manner in all three states. The Council tasked the GMT with developing a matrix describing mortality by species and depth ("discard mortality matrix") in time to be analyzed in this EIS. The methods for estimating discard mortality rates were reviewed by the SSC during the April 2008 Council meeting, and their suggestions were incorporated into the results presented here.

Methods and Results

The GMT's review and discussion of the state of knowledge on discard mortality identified three categories of mortality. First, the team considered "surface" mortality, i.e. mortality that is observable when a fish is brought to the surface, handled on deck, and thrown back. Second, the team considered short-term, below-surface mortality that has been documented in research trials to a limited extent using underwater cameras or divers. Lastly, the team took into consideration longer-term, below-surface mortality that is essentially unobservable in the field and for which there is little, if any, information available in the literature. Documentation of the scientific literature that the team reviewed can be found in Appendix A. *[This documentation will be provided after the June 2008 Council meeting]* During subsequent biennial specification processes, the team will review the latest research and data available and determine whether they can be incorporated into the discard mortality matrix.

Estimates of Surface Mortality

Estimates of surface mortality were created in a two-step analysis. First, the GMT performed a generalized linear model (GLM) analysis of species disposition by depth on a data set created from observations of discarded fish taken onboard recreational charter boats. Second, to account for species for which insufficient observer data were available, the team performed a guild-based GLM analysis that compared mortality rates among groups of species with similar depth distribution and vertical orientation in the water column.

<u>Description of Available Data on Surface Mortality</u>

The GMT analyzed three data sets with information on the disposition of discarded fish (live or dead) by species and capture depth (10-fm increments) from the California Recreational Fishery Survey (CRFS), the California Department of Fish and Game (CDFG) Commercial Passenger Fishing Vessel Onboard Observer Program, and the Oregon Department of Fish and Wildlife (ODFW) Onboard Observation Program.

The first data set combined observations from the CDFG CPFV Onboard Observer Program from Point Conception to Fort Bragg from 1987 to 1998 and the CRFS CPFV Onboard Observer Program/ODFW Onboard Recreational Boat Sampling (ORBS) data from the Oregon/Washington border to Mexico from 2005 to 2007. Observers recorded the disposition of discarded catch for a subset of anglers onboard the boat. Observers either watched a fish as it was discarded or asked the angler whether the fish was bleeding from the gills or floated away (dead) as opposed to swimming back down (alive). The second data set was constructed from the CRFS/ORBS Onboard Observer Program Sampler Examined Discards collected from Mexico to the Oregon/Washington border between 2003 and 2007 ("Type 3d"). The onboard sampler recorded the condition of the discarded fish after taking length measurements and discarding the fish.

The California data sets are not independent of one another because the Type 3d data are a subset of the tallied fish from the combined CRFS-CPFV data. The team discussed the relative merits of the two data sets and the GMT concluded that the combined CRFS-CPFV data had the advantage of a larger sample size and greater range of encounter depths. However, the team concluded that the Type 3d data set was more reliable because of the direct observation of the discarded fish by the sampler and the greater sample size for overfished species such as yelloweye rockfish. Thus the Type 3d sampler-examined discard was used in the GLM analyses.

Average bottom depth over a drift was used to approximate the depth at the location of capture. Semi-pelagic and pelagic species may have ascended from mid-water when caught and therefore the recorded bottom depth is not necessarily the depth of capture. Recorded depth should be regarded as ascribing mortality to fish caught while fishing in or around a given depth bin.

GLM Model Description and Results

The proportion of fish released dead (the "mortality rate") as recorded in the Type 3d data set, π, was modeled using a quasi-binomial generalized linear model (GLM) with a logit link function (McCullagh and Nelder, 1989).

$$\log\left(\frac{\pi_i}{1-\pi_i}\right) = x_i^T \beta \qquad [1]$$

This model is similar to a binomial GLM in that $E[Y_i | X_i] = n_i \pi_i$, but it includes an "overdispersion" parameter, ϕ, in the variance function: $V[Y_i | X_i] = \phi n_i \pi_i (1-\pi_i)$. Overdispersion can be the result of dependence between trials or unexplained heterogeneity within a group. An error in the structural form of the model can also give the appearance of overdispersion. Although overdispersion was detected for these data, the relative contribution of these effects is unknown.

Species and depth (by 10-fm bin) were included in the model as categorical variables. Due to smaller sample sizes, depths greater than 50 fm were excluded. Species with small sample sizes (*S. chrysomelas, S. nebulosus, S. maliger* and *S. rastrelliger*) were excluded to stabilize the parameter estimation procedure. Discard mortality estimates for these four species are based on the by-guild GLM analysis.

The observed and predicted proportions of fish released dead are plotted by species and depth in Figure 4-15. Table 4-41 reports sample sizes by species and depth bin. Observations based on less than 5 fish were excluded from Figure 4-15.

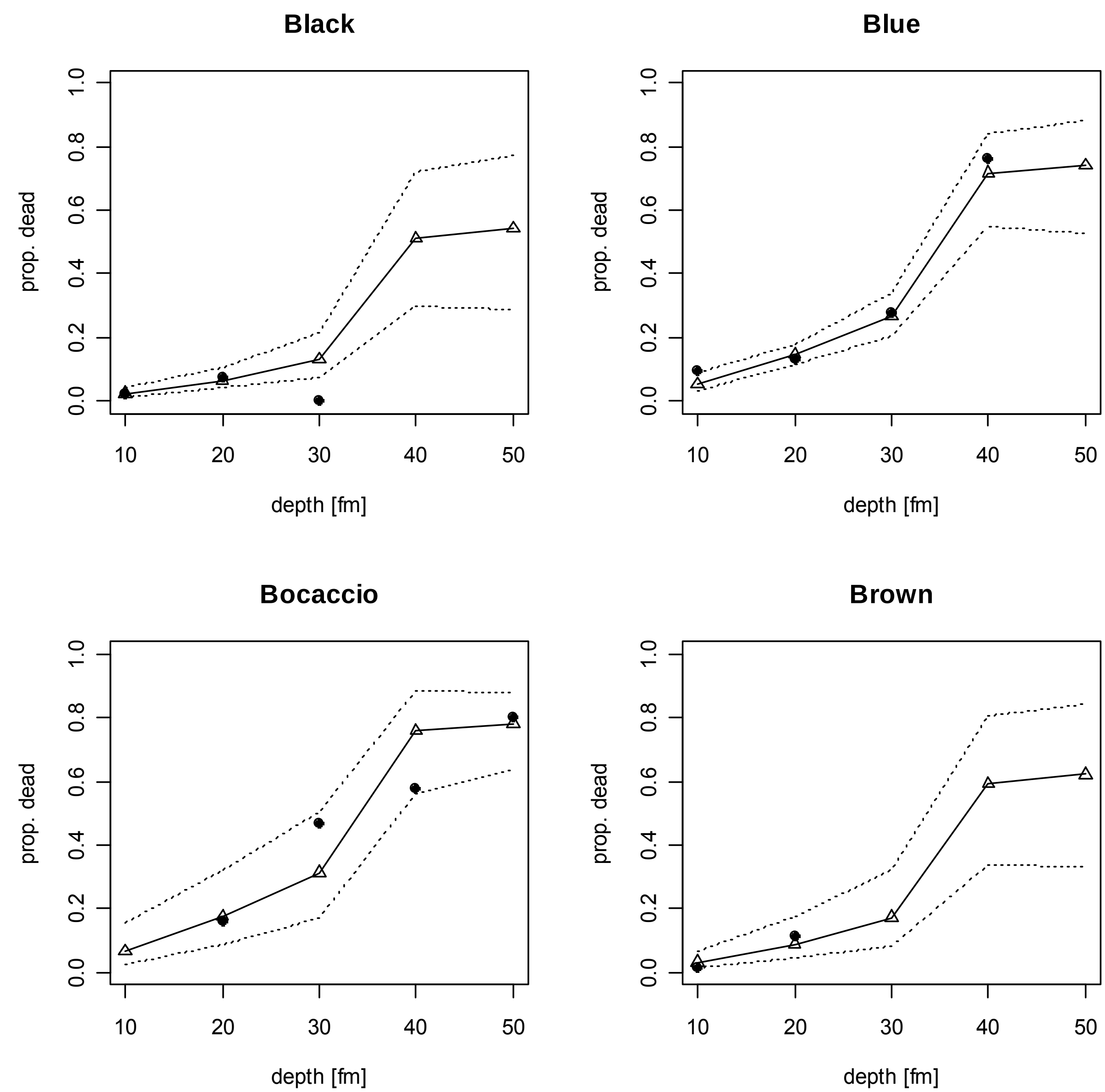


Figure 4-15. Comparison of GLM predictions of the proportion of fish released dead at the surface with observed proportions, by species and 10-fm depth bin. Observations with samples sizes less than 5 were not plotted. Observed = solid circles, predicted = solid line with triangles, dotted lines represent 95% confidence intervals.

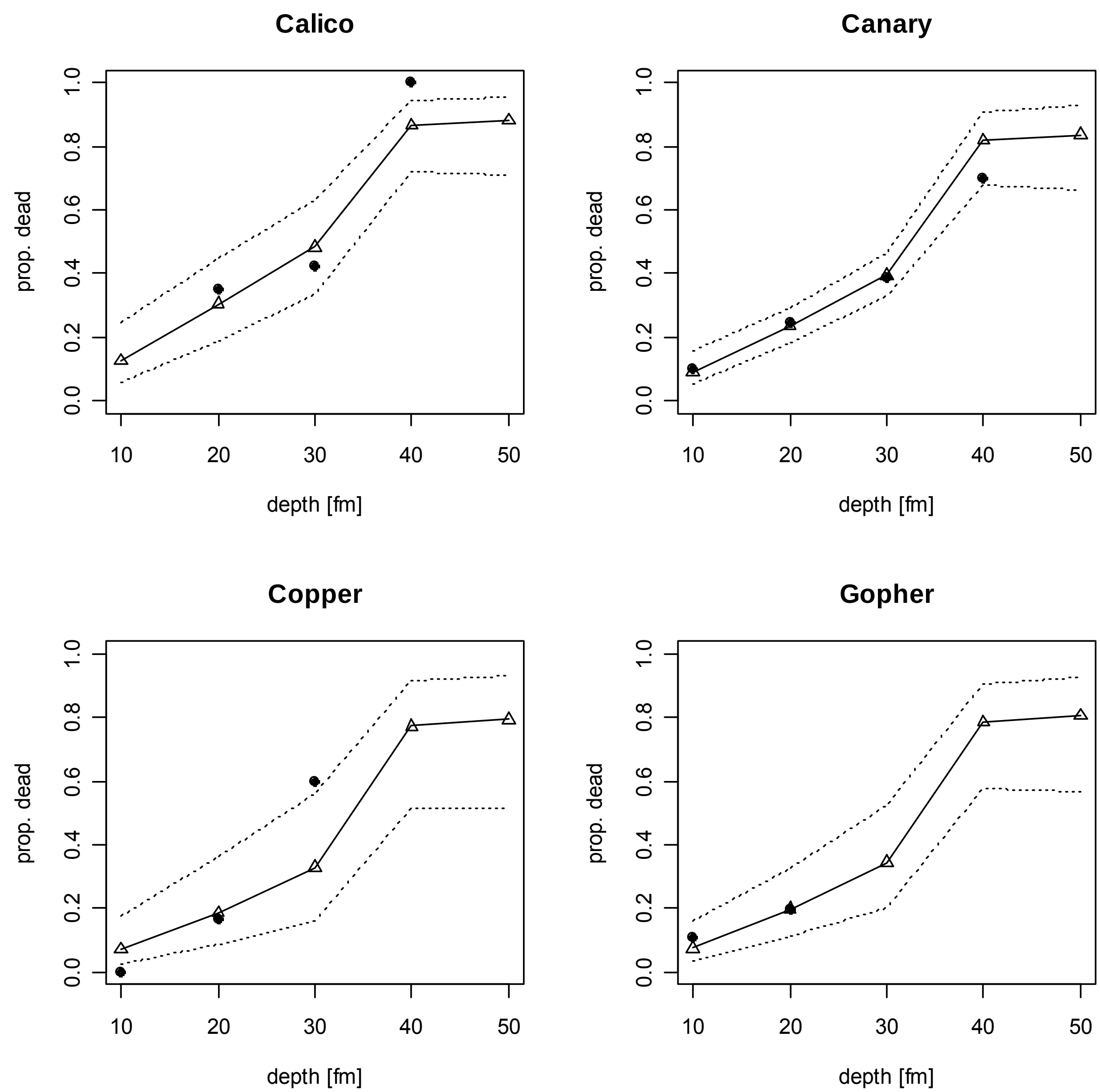


Figure 4-15. Comparison of GLM predictions of the proportion of fish released dead at the surface with observed proportions, by species and 10-fm depth bin. Observations with samples sizes less than 5 were not plotted. Observed = solid circles, predicted = solid line with triangles, dotted lines represent 95% confidence intervals (continued).

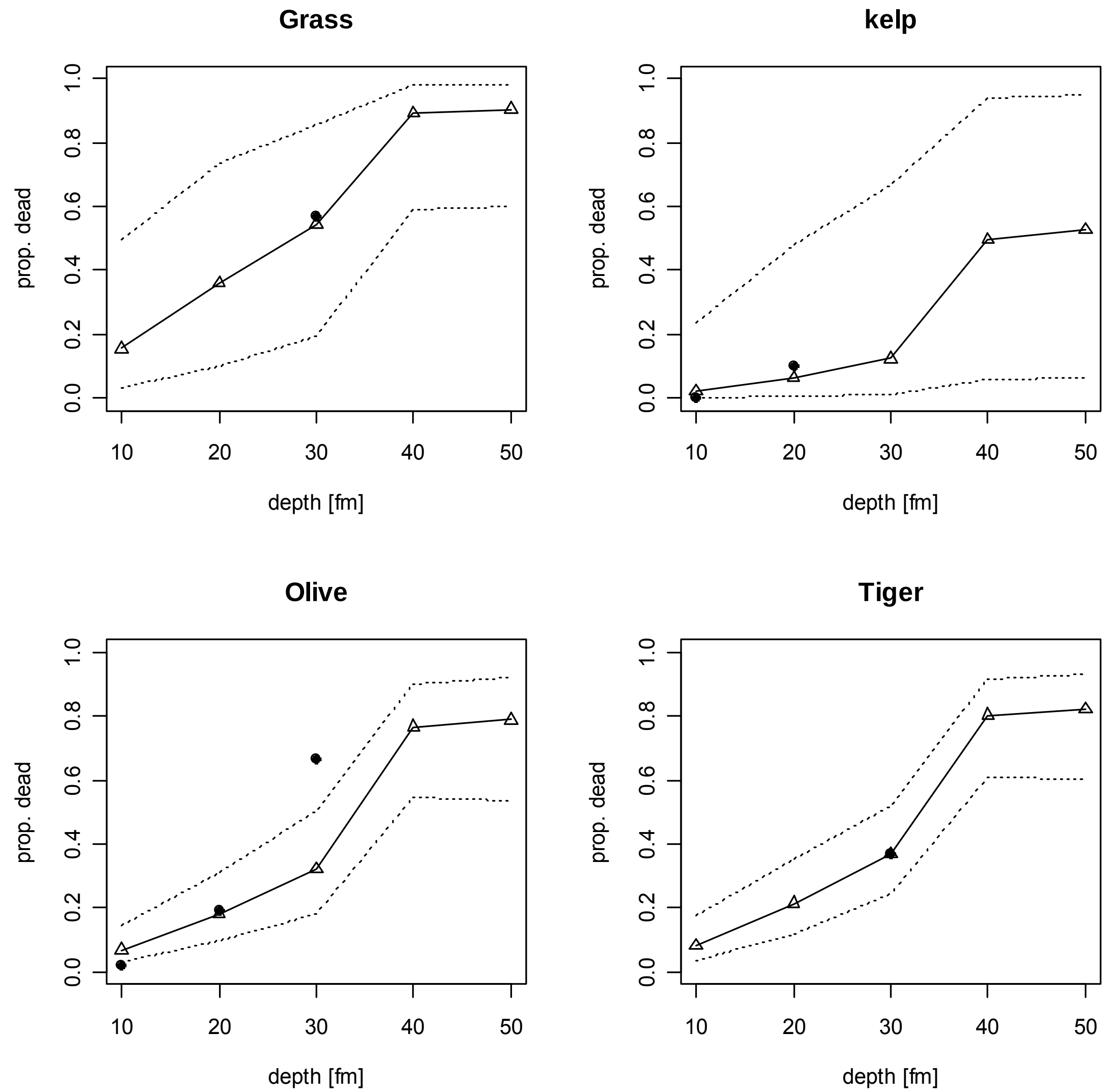


Figure 4-15. Comparison of GLM predictions of the proportion of fish released dead at the surface with observed proportions, by species and 10-fm depth bin. Observations with samples sizes less than 5 were not plotted. Observed = solid circles, predicted = solid line with triangles, dotted lines represent 95% confidence intervals (continued).

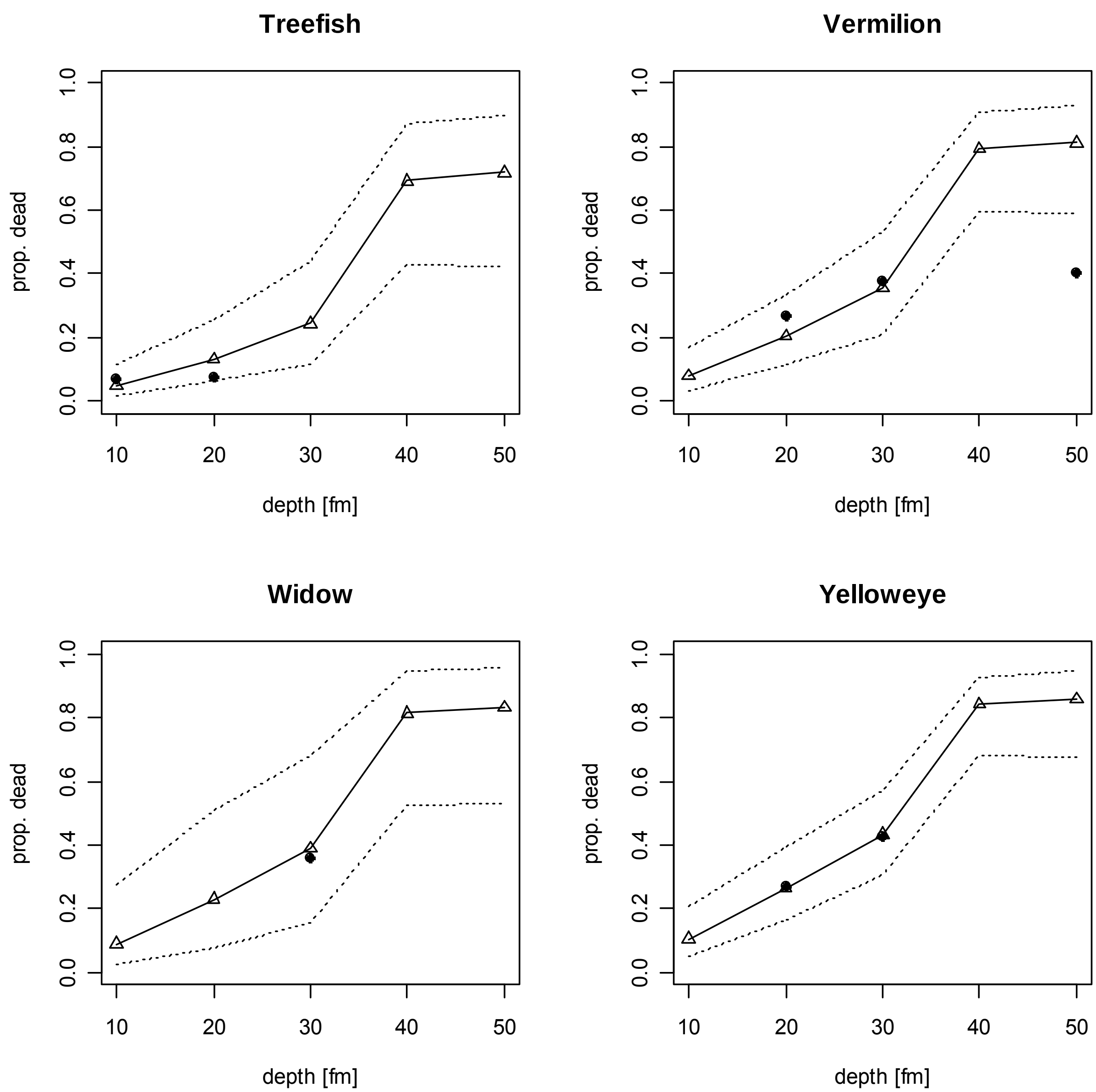


Figure 4-15. Comparison of GLM predictions of the proportion of fish released dead at the surface with observed proportions, by species and 10-fm depth bin. Observations with samples sizes less than 5 were not plotted. Observed = solid circles, predicted = solid line with triangles, dotted lines represent 95% confidence intervals (continued).

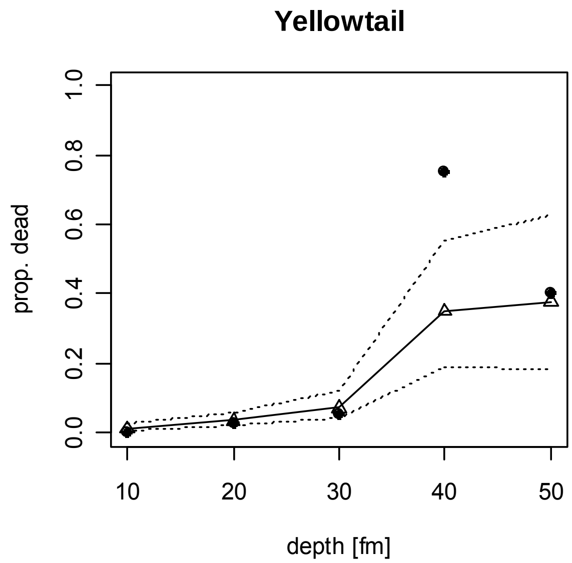


Figure 4-15. Comparison of GLM predictions of the proportion of fish released dead at the surface with observed proportions, by species and 10-fm depth bin. Observations with samples sizes less than 5 were not plotted. Observed = solid circles, predicted = solid line with triangles, dotted lines represent 95% confidence intervals (continued).

Table 4-41. Sample sizes by species and depth; data used in GLM model for surface mortality.

Species	Depth Bin (fm) 10	20	30	40	50
Black	254	303	11		
Blue	136	632	108	17	4
Bocaccio		19	15	19	66
Brown	141	89	1	1	
Calico	1	40	38	5	
Canary	10	249	225	10	1
Copper	5	43	5		
Gopher	19	76	3	2	
Grass	3	2	7		
kelp	18	10			
Olive	48	57	6	2	
Tiger			76		
Treefish	29	66	4		
Vermilion	3	67	8	4	5
Widow		2	14	3	2
Yelloweye	2	26	66	4	
Yellowtail	14	210	174	12	5

Although the interaction between species and depth was significant, leaving this term in the model reproduces the observed proportions exactly and provides no method for estimating missing cells. Because predictions from the model without the interaction term were quite good in most cases (Figure 4-15), the simpler model was chosen to estimate surface mortality rates (Table 4-42). Upper 95% confidence limits illustrate the degree of uncertainty associated with the GLM predictions (Figure 4-15, Table 4-43), and were consulted during precautionary adjustments to model predictions. Since upper 95% confidence limits for surface mortality approach 100% at depths greater than 30 fm, mortality beyond this depth was assumed to be 100%. The two exceptions to this approach were yellowtail and black rockfish, given their relatively low mortality rates.

The GLM predicts mortality rates from a combination of species and depth effects, so all cells in Tables 4-42 and 4-43 have predicted mortality rates. Tables 4-44 and 4-45 present GLM predictions and upper 95% confidence limits, respectively, adjusted for short- and long-term, below-surface mortality (described below).

Guild-based GLM Analysis

An analysis was conducted to estimate surface mortality for groups of species ('guilds') that have similar distribution in the water column (pelagic vs. demersal) and differences in depth distribution (deep vs. shallow) (Table 4-46). Guilds were based on published information regarding depth distribution and orientation in the water column {Love, *et al.* 2002} and collective experience of team members.

Data (Type 3d) for species within each guild were combined and re-analyzed using a quasi-binomial GLM as described above (Figure 4-16, Tables 4-47 to 4-51). In addition to depth of capture, this approach assumes that discard mortality depends on general patterns of depth distribution and orientation in the water column, characteristics which may not be clearly defined for all species. Therefore, precaution is advised when applying these rates since the model does not account for uncertainty associated with misclassification. Nonetheless, this method provides a means for assigning depth-specific discard mortality rates to species for which there is little or no data, based on information available from other species with similar characteristics.

Table 4-42. Predicted percentage released dead (surface mortality only) from the GLM.

Species	Depth Bin (fm)				
	10	**20**	**30**	**40**	**50**
Black	2%	7%	13%	51%	54%
Blue	5%	15%	27%	72%	74%
Bocaccio	6%	17%	31%	76%	78%
Brown	3%	9%	17%	59%	62%
Calico	12%	30%	48%	87%	88%
Canary	9%	23%	39%	82%	84%
Copper	7%	19%	33%	77%	79%
Gopher	7%	20%	34%	79%	81%
Grass	15%	36%	55%	89%	90%
kelp	2%	6%	12%	50%	53%
Olive	7%	18%	32%	77%	79%
Tiger	8%	21%	37%	80%	82%
Treefish	5%	13%	24%	69%	72%
Vermilion	8%	20%	35%	79%	81%
Widow	9%	23%	39%	82%	83%
Yelloweye	10%	26%	43%	84%	86%
Yellowtail	1%	3%	7%	35%	38%

Table 4-43. Upper 95% confidence limits of GLM predictions for surface mortality.

Species	Depth Bin (fm)				
	10	**20**	**30**	**40**	**50**
Black	4%	11%	22%	72%	77%
Blue	9%	18%	34%	84%	88%
Bocaccio	15%	32%	50%	89%	88%
Brown	7%	17%	32%	81%	85%
Calico	25%	45%	63%	94%	96%
Canary	16%	29%	47%	91%	93%
Copper	18%	36%	56%	92%	93%
Gopher	16%	33%	52%	91%	93%
Grass	49%	74%	86%	98%	98%
kelp	23%	48%	67%	94%	95%
Olive	14%	31%	51%	90%	92%
Tiger	18%	35%	52%	91%	93%
Treefish	11%	26%	44%	87%	90%
Vermilion	17%	34%	53%	91%	93%
Widow	28%	51%	68%	95%	96%
Yelloweye	21%	39%	57%	93%	95%
Yellowtail	3%	6%	12%	55%	63%

Table 4-44. Estimated percentage of fish released dead, based on GLM predictions of surface mortality adjusted by estimates of short- and long-term, below-surface mortality.

Species	Depth Bin (fm)				
	10	20	30	40	50
Black	11%	20%	29%	63%	67%
Blue	18%	30%	43%	79%	82%
Bocaccio	19%	32%	46%	82%	85%
Brown	12%	22%	33%	69%	73%
Calico	24%	43%	60%	90%	92%
Canary	21%	37%	53%	87%	89%
Copper	19%	33%	48%	83%	86%
Gopher	19%	34%	49%	84%	87%
Grass	23%	45%	63%	92%	93%
kelp	11%	19%	29%	61%	66%
Olive	34%	45%	57%	86%	88%
Tiger	20%	35%	51%	86%	88%
Treefish	14%	25%	39%	76%	80%
Vermilion	20%	34%	50%	85%	87%
Widow	21%	36%	52%	86%	89%
Yelloweye	22%	39%	56%	88%	90%
Yellowtail	10%	17%	25%	50%	55%

Table 4-45. Upper 95% confidence limits for percentage of fish released dead, based on GLM predictions of surface mortality adjusted by estimates of short- and long-term, below-surface mortality.

Species	Depth Bin (fm)				
	10	20	30	40	50
Black	13%	23%	36%	79%	84%
Blue	21%	32%	49%	88%	92%
Bocaccio	26%	44%	61%	92%	92%
Brown	15%	29%	45%	85%	89%
Calico	34%	55%	71%	96%	97%
Canary	27%	42%	59%	93%	95%
Copper	28%	48%	66%	94%	95%
Gopher	27%	44%	63%	93%	95%
Grass	54%	77%	88%	98%	99%
kelp	31%	55%	73%	95%	96%
Olive	39%	54%	69%	94%	96%
Tiger	28%	47%	62%	94%	95%
Treefish	20%	36%	54%	90%	93%
Vermilion	28%	45%	64%	93%	95%
Widow	37%	60%	75%	96%	97%
Yelloweye	31%	50%	67%	95%	96%
Yellowtail	12%	19%	29%	66%	73%

Table 4-46. Species composition of guilds based on depth distribution and orientation in the water column.

Guild	Species Included in Guild (RF=Rockfish)
Shallow Pelagic	Black RF, Olive RF, Yellowtail RF
Shallow Demersal	Brown RF, Grass RF, Kelp RF, Treefish.
Deep Pelagic	Bocaccio RF, Widow RF, Canary RF, Blue RF
Deep Demersal	Vermilion RF, Copper RF, Yelloweye RF, Gopher RF

Short-Term Below-Surface Estimates of Mortality

The GMT reviewed additional studies to identify information regarding delayed/long term mortality in addition to the baseline mortality rate provided by the GLM.

Albin and Karpov (1996) provided estimates of additional mortality accrued on recreationally caught rockfishes in 0-180 feet of water from 1-5 days after capture. In order to account for variation in mortality rate with depth, the data for 1-5 day mortality by species was grouped by shallow and deep-dwelling species to estimate delayed/long-term mortality rates based on predominant depth of occurrence. The GMT agreed to adjust the GLM results with additional mortality based on proportions from the Albin and Karpov study to provide an estimate of surface and short-term, below-surface discard mortality. For deep-water species, a short-term below-surface mortality estimate of 8.33% was incorporated into the mortality rate predicted by the GLM. For shallow-water species, a short-term below-surface mortality estimate of 4.55% was added. A separate adjustment (25.6%) was added to the GLM estimate for olive rockfish due to an unrepresentatively high estimate of long-term mortality at depth that dramatically changed the mortality estimate for shallow species.

Long-Term Delayed Estimates of Mortality

The GMT discussed the potential for long-term effects from releasing fish caught at varying depths. Fish that appear to be unharmed after catch and release may have unidentified problems, ranging from swim bladder or internal organ damage to reduced reproductive success or other factors affecting mortality rates. Very little is known about delayed mortality of discards other than there is some likely long-term effect associated with catch and release. In order to account for the uncertainty in delayed mortality, the GMT discussed further adjustment of mortality rates that were based on the GLM estimates and Albin and Karpov data. For species with swim bladders, the GMT considered rates between 2 and 5 percent for fish with swim bladders released between 0 and 10 fm. Due to the lack of available information, the GMT settled on using the higher value of 5 percent as a more conservative rate. Delayed mortality for species subject to barotrauma is expected to increase with greater changes in ambient pressure (i.e. increasing depth of capture). Based on this assumption, the GMT included an additional 5% mortality for each 10 fm of depth of capture. This component of mortality is considered independent of the GLM-estimated surface mortality and short-term below-surface mortality based on the Albin and Karpov data.

Pacific cod is another species with a swim bladder and is therefore subject to barotrauma. There is very little information on discard mortality for Pacific cod so the GMT recommends using a 5% discard rate based on hooking mortality for Pacific cod caught in the 0-10 fm range and recommends applying the combined average for all rockfish data from the GLM results for the 11-20 and the 21-30 depth bins.

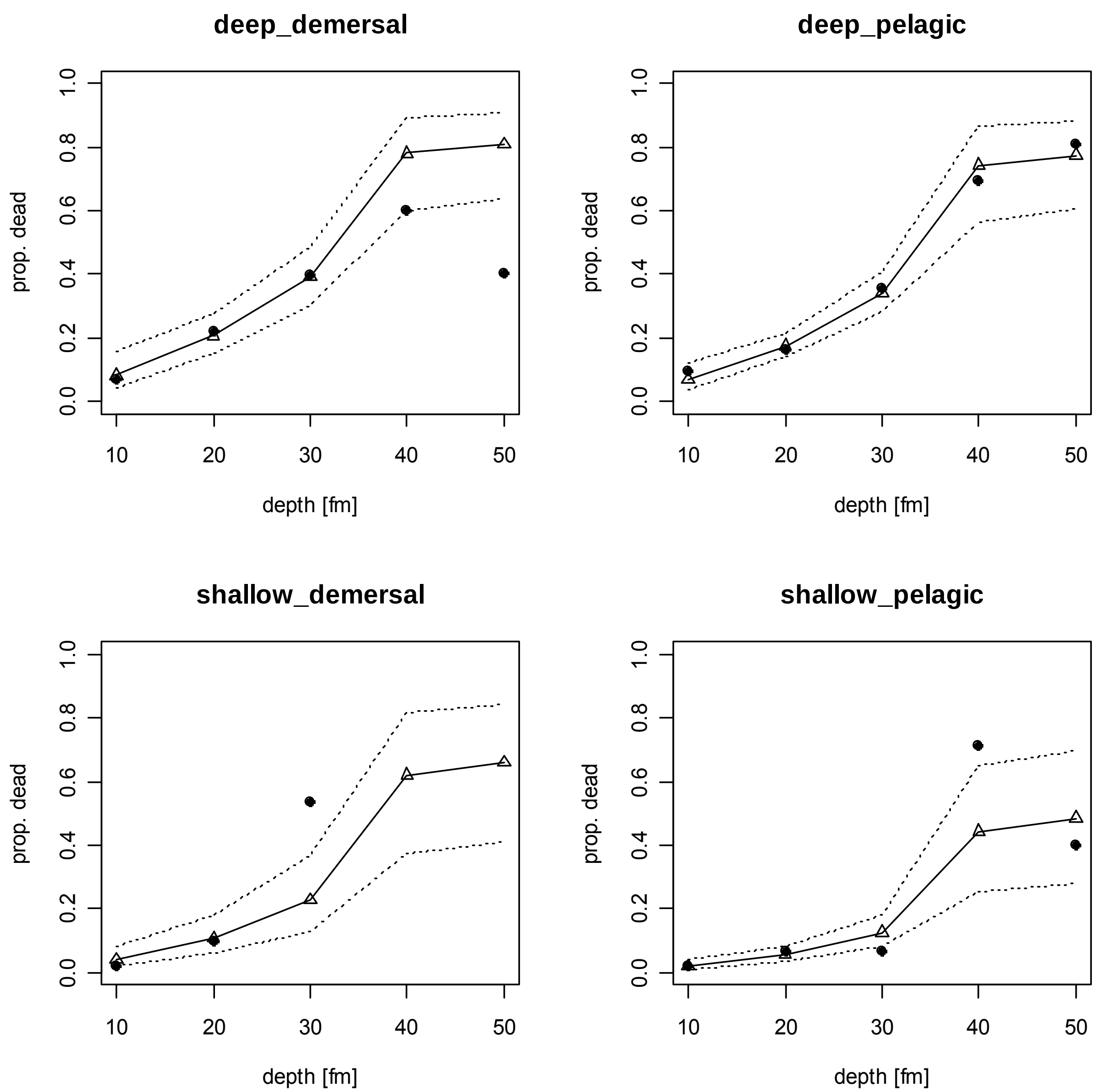


Figure 4-16. Comparison of guild-based GLM predictions of the proportion of fish released dead at the surface with observed proportions, by 10-fm depth bin. Samples sizes less than 5 were excluded. Observed = solid circles, predicted = solid line with triangles, dotted lines represent 95% confidence intervals.

Table 4-47. Sample sizes by species and depth from data used in guild-based GLM analysis.

Guild	Depth Bin (fm)				
	10	20	30	40	50
deep demersal	29	212	158	10	5
deep pelagic	146	902	362	49	73
shallow demersal	195	171	15	1	
shallow pelagic	316	570	191	14	5

Table 4-48. Predicted percentage released dead from guild-based GLM (surface mortality).

Guild	Depth Bin (fm)				
	10	20	30	40	50
deep demersal	9%	21%	38%	81%	84%
deep pelagic	6%	15%	29%	73%	77%
shallow demersal	4%	11%	23%	66%	70%
shallow pelagic	2%	5%	12%	48%	53%

Table 4-49. Upper 95% confidence limits of guild-based GLM predictions (surface mortality).

Guild	Depth Bin (fm)				
	10	20	30	40	50
deep demersal	17%	29%	49%	92%	93%
deep pelagic	11%	19%	38%	87%	88%
shallow demersal	9%	19%	38%	85%	87%
shallow pelagic	4%	8%	18%	70%	74%

Table 4-50. Predicted percentage released dead from guild-based GLM, adjusted for short- and long-term mortality (Albin and Karpov; GMT linear adjustment).

Guild	Depth Bin (fm)				
	10	20	30	40	50
deep demersal	21%	35%	52%	86%	89%
deep pelagic	18%	30%	45%	80%	84%
shallow demersal	13%	24%	37%	74%	79%
shallow pelagic	11%	19%	29%	60%	66%

Table 4-51. Upper 95% confidence limits of guild-based GLM predictions, adjusted for short- and long-term mortality (Albin and Karpov; GMT linear adjustment).

Guild	Depth Bin (fm)				
	10	20	30	40	50
deep demersal	28%	41%	60%	94%	95%
deep pelagic	23%	33%	52%	90%	92%
shallow demersal	17%	31%	50%	89%	91%
shallow pelagic	13%	21%	34%	77%	81%

Multiplicative adjustment for short- and long-term mortality

Surface mortality rates from the GLM were adjusted for below-surface, short- and long-term mortality based on the assumption that each stage of mortality was independent from the previous stages. Survival rates (fraction alive = 1 – [fraction dead]) for the three stages of mortality were multiplied together and the product was subtracted from one to produce an estimate of total mortality.

Major uncertainties and data needs

- Limited data for several species
- Very limited information about post-release mortality rates
- Insufficient data to evaluate differences in depth effects among species (interaction terms in the GLM)
- Lack of depth-specific information in delayed mortality adjustments
- No additional uncertainty associated with delayed mortality adjustment
- The data do not cover the entire coast (i.e., ends at the OR/WA border), and ignore possible regional differences (e.g. temperature effects).

The GMT recommends managing 2009-10 recreational fisheries using the discard mortality rates shown in Table 4-52 for use in estimating discard mortalities. This table should be updated each biennium and incorporate new research findings and data as appropriate.

Table 4-52. Estimated discard mortality rates for recreationally important groundfish species.

Species Group	Species	Depth Bin 0-10 fm	11-20 fm	21-30 fm	>30 fm
Rockfish	Black Rockfish	11%	20%	29%	63%
	Black and Yellow Rockfish	13%	24%	37%	100%
	Blue Rockfish	18%	30%	43%	100%
	Bocaccio	19%	32%	46%	100%
	Brown Rockfish	12%	22%	33%	100%
	Calico Rockfish	24%	43%	60%	100%
	Canary Rockfish	21%	37%	53%	100%
	China Rockfish	13%	24%	37%	100%
	Copper Rockfish	19%	33%	48%	100%
	Gopher Rockfish	19%	34%	49%	100%
	Grass Rockfish	23%	45%	63%	100%
	Kelp Rockfish	11%	19%	29%	100%
	Olive Rockfish	34%	45%	57%	100%
	Quillback Rockfish	21%	35%	52%	100%
	Tiger Rockfish	20%	35%	51%	100%
	Treefish	14%	25%	39%	100%
	Vermilion Rockfish	20%	34%	50%	100%
	Widow Rockfish	21%	36%	52%	100%
	Yelloweye Rockfish	22%	39%	56%	100%
	Yellowtail Rockfish	10%	17%	25%	50%
Other Fish	Cabezon	7%	7%	7%	7%
	California scorpionfish	7%	7%	7%	7%
	Kelp Greenling	7%	7%	7%	7%
	Lingcod	7%	7%	7%	7%
	Pacific Cod	5%	32%	53%	97%
General Cat.	Flatfish	7%	7%	7%	7%
	Sharks and Skates	7%	7%	7%	7%
	Dogfish	7%	7%	7%	7%

4.5.1.7 *Washington Recreational*

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 . 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 collects information on released catch but 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 on charter vessels throughout the salmon season primarily to observe hatchery salmon mark rates but also to collect rockfish discard information on these 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 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 are stratified due to differences in effort patterns on weekdays versus weekend days. 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, three 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:

$$\text{Exit Count} \,/\, \text{Total boats sampled} \; * \; P_S \text{ sampled} = P_t$$

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:

Total Weekday Catch = = $\Sigma(P_t)$ on sampled weekdays / number weekdays sampled * no. of weekdays in stratum;

Total Weekend Catch =$\Sigma(P_t)$ on sampled weekend days / number weekend days sampled * no. weekend days in stratum number;

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, or albacore).

Washington Recreational Fishery Impact Modeling

<u>Pre-Season Catch Projections</u>

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 . This is especially true if recreational regulations remain consistent.

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 depths 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 subarea and fishery. The Washington recreational management measures for 2009-2010 will continue to include prohibiting fishing deeper than 20 or 30 fm (depending upon time and management subarea); therefore, the depth analysis was again used to determine the catch and mortality of discarded fish for 2009-2010 pre-season catch projections 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 (based upon average depth distribution of catch from intercept surveys).
- 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).

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.

<u>Inseason Catch Projections for 2009-2010</u>

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. In 2009-2010, depth dependant mortalities will be applied uniformly to all discarded fish coast wide through . This will replace the mortality estimates for canary and yelloweye used in 2007-2008. Projected impacts for 2009-2010 were based on 2007-2008 impact estimates and the depth analysis described above. The 2007-2008 impact model was used because post season catch estimates could not be recalculated using the new mortality estimates and at the time, the coastwide depth dependant mortality matrix was still preliminary. 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 unforeseen factors.

4.5.1.8 *Oregon Recreational*

Modeling the Effects of Oregon 2009-10 Recreational Groundfish Management Measures

Data Source for Base Model

Modeling of expected 2009-10 Oregon recreational fishery impacts of selected groundfish species 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 Ocean Recreational Boat Survey (ORBS). For the shore and estuary fishery, the data source was the Marine Recreational Fisheries Statistics Survey (MRFSS). Analyzed species included black, blue, brown, canary, china, copper, grass, quillback, and yelloweye rockfishes; as well as kelp and rock greenling, cabezon and lingcod. Base level landings and discards for the ocean boat fishery (in numbers of fish) were based on normalized 2005, 2006 and 2007 landings and discards because these data reflect fishery years with regulations most similar to those expected in 2009-10 (i.e., bag limits, offshore closures, behavioral activities to avoid overfished species, etc.). Base level 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. Annual weights of greenling and cabezon were adjusted to reflect changes in minimum length.

Normalizing 2005, 2006, and 2007 Ocean Boat Catch and Angler Trip Data

A base year period of 2005-07 was chosen for modeling catch and angler effort. Equal weighting was given to each year as it is not possible to forecast the opportunity for other targeted fisheries (i.e., salmon, halibut, tuna, etc.) in 2009-10. The fisheries in 2005-07 vary in both angler opportunity and success for other target species such as salmon, tuna and halibut. All three base years include groundfish fishery restrictions (e.g., offshore closures and restrictions on groundfish retention in the directed Pacific halibut fishery).

To facilitate providing maximum flexibility in modeling 2009-10 fishery options, landings in 2005, 2006 and 2007 were normalized to a 10-fish marine bag limit and a year round season with no offshore closures (essentially the basic regulations from 2000 through 2003). Starting in 2004 the sport fishery was managed with offshore closures to reduce impacts on overfished species (i.e., lingcod, canary rockfish, and yelloweye rockfish); the marine fish bag limit of 10 was carried over from 2003. In response to an early closure in 2004 due to attainment of the black rockfish harvest guideline, the marine bag limit in 2005 started at 8 fish on January 1 and was reduced to 5 fish on July 16. During 2006-08 the marine fish bag limit imposed under state regulations was 6 fish to provide for a year round nearshore fishery and not exceed the black rockfish harvest guideline. The marine fish bag limit includes rockfish, greenling, cabezon and other species excluding lingcod, flat fish, Pacific halibut, salmon, trout, steelhead, perch, sturgeon, striped bass, offshore pelagic species, and bait fish (herring, smelt anchovies and sardines).

Normalizing to a 10-fish marine bag limit was accomplished through comparing the average catch per angler trip (CPUE) under 8, 6 and 5 fish regulations in 2005-07 with comparable periods in 2003-04 under a 10 fish marine bag limit. The average CPUE change from 10 to 8 fish was a 13.5 percent reduction, which compared to a 34.3 and 37.8 percent reduction when reducing the bag limit from 10 to 6 and 5 fish, respectfully. The same exercise was also applied to discards per angler as the number discarded for many species for which retention was allowed generally increased as the retention bag limit was reduced. The average duration of groundfish trips did not change, but anglers sorted through more fish. The number of yelloweye rockfish and canary rockfish encountered, both species for which all retention was prohibited in the model base years, was not adjusted due to the reduced marine bag limit as the average duration of groundfish angler trips were nearly the same regardless of the marine bag limit. These adjustments were not made for lingcod, which has a separate bag limit.

Landings and discards were normalized to an all-depth season. In 2004-06, from June through September the groundfish fishery was closed seaward of the 40-fm line; for 2007 the offshore closure seaward of 40-fm occurred from April through September. The expected increase in encounter rates for offshore residing species (i.e., yelloweye rockfish and canary rockfish) in normalizing to an all-depth scenario was based on data from 2001 and 2003-07 at-sea observations on Oregon charter vessels (over 500 trips were observed). The observer study was not conducted in 2002. The following increased encounter rate (numbers of fish) were applied to appropriate months (those that were closed seaward of 40-fm) when normalizing to an all-depth fishery: canary rockfish = 1.20 and yelloweye rockfish = 1.47.

Landings and discards in 2005 were normalized to a year round season as the fishery was closed earlier than scheduled. 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 2004-05, 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. Estimating potential catch for October through December in 2005 was based on normalized January through September 2005 estimates and applying the monthly temporal pattern observed in 2003.

The expected weight of landed fish was based on the 2005-07 average by species and month for the ocean boat fishery. The expected average weight of discarded fish in the ocean boat fishery was based on combined at-sea observations in 2003-2007 with attention paid to matching samples with depth closure regulations (releases were not measured on 2001 at-sea trips). Observations indicate that yelloweye rockfish and canary rockfish caught inside of the 40-fm line were considerably smaller compared to the average size of those caught offshore as it appears more juveniles of these species reside nearshore. An exception in the method to estimate the size of discards was made for nearshore rockfish species, other than black rockfish and blue rockfish, due to small sample sizes (most are retained), where a 50 percent reduction in average landed weight was assumed for discards. The fifty percent reduction in average weight was based on the observed average size of discarded black rockfish and blue rockfish which were on the order of a 50 percent reduction from average landed weight. A 50 percent reduction was also used for greenling species since they are also rarely released.

Ocean boat angler trip data from 2005 was also normalized using the 2003 temporal pattern to estimate groundfish effort during October through December when the nearshore fishery was closed.

Angler effort in shore and estuary areas was 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 combined, thus all projections of angler trips by trip type exclude shore and estuary.

Model Inputs

Bag limits, offshore closures, season structure and halibut quotas were the basic input factors applied to the standardized model.

Bag limits were modeled to range from 6 to 10 marine fish and from 2 to 3 lingcod. Fish species included in the marine bag limit were defined earlier in this report. The expected reduction in CPUE from reducing the marine bag limit from 10 fish was based on the same comparison between a 10 and 8, 6 or 5 bag limit discussed earlier in this report. In estimating expected reductions in CPUE for marine bag limits a linear relationship was developed using the observations between 10, 8, 6 and 5 fish bag limits (Figure 4-17). The number of released fish of species for which retention is not prohibited was estimated to increase as the bag limit was reduced (Figure 4-18). As assumed in normalizing the model no effect on CPUE was expected for the non-retention species yelloweye rockfish and canary rockfish for changes in the marine fish bag limit (refer to earlier discussion in this report).

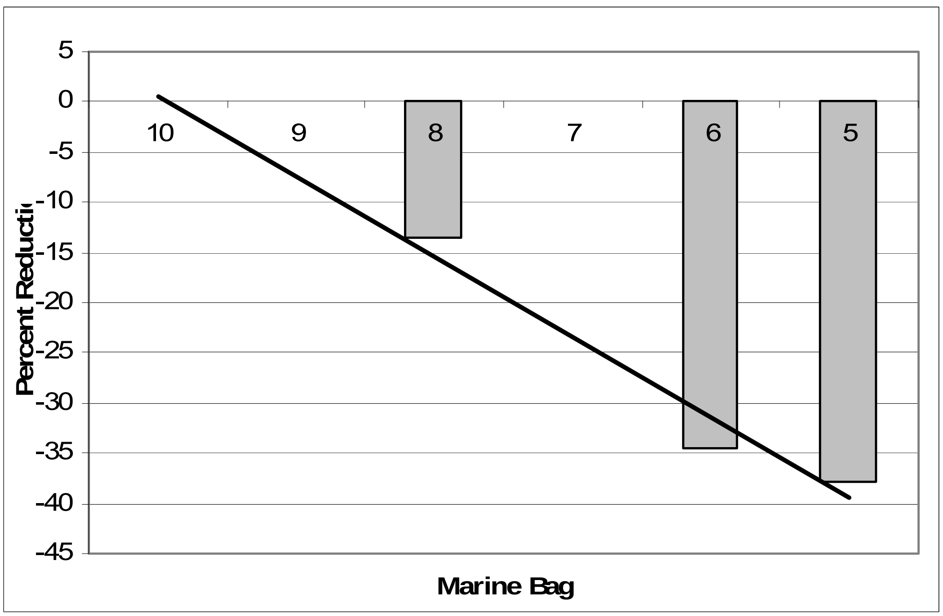


Figure 4-17. Percent reduction of catch per angler under decreasing marine bag limits for nearshore groundfish.

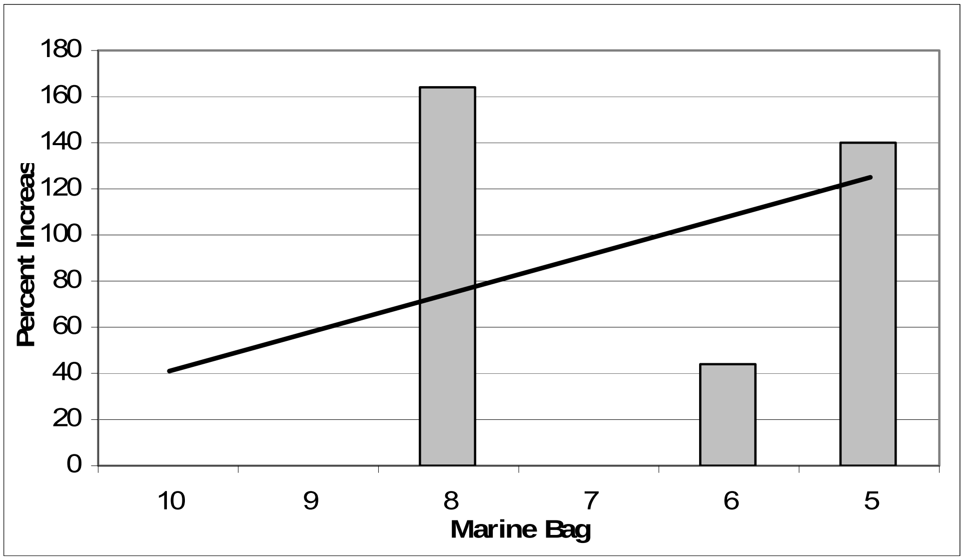


Figure 4-18. Percent increase of release per angler with decreasing marine bag limits for nearshore groundfish.

Estimates were also made for the effect of increasing the lingcod bag limit from 2 to 3 fish on landed fish and were made external to the impact model. In the ocean boat fishery the analysis from the 2007-08 EIS was carried forward; sample data from 2005 was used to determine the percent of anglers that had achieved their 2 fish bag limit in 2005 (6.3%). Assuming each of these anglers would have retained a third fish under a 3 fish bag resulted in a 10 percent increase of total fish landed (applied to the 2005-07 average landings). 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 during the peak summer fishing periods (if not all year under some options).

Expected encounter rate reductions for yelloweye rockfish and canary rockfish normally encountered in offshore waters were developed for offshore closures outside of 40, 30, 25, and 20 fm (Table 4-53). They were based on the at-sea observations mentioned earlier in the report. Modeling assumptions included a shift in offshore effort (7 percent of total groundfish directed effort) to open areas nearshore during offshore closure periods affecting the catch rates of fish encountered.

Table 4-53. Percent total encounter reductions in yelloweye rockfish and canary rockfish due to depth closures.

2001, 2003-2007 Distribution of encounters by depth bin (fm) from at-sea observations (fishery open all depths)						
Species	<20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	(n)
Canary rockfish	59%	15%	5%	7%	16%	518
Yelloweye rockfish	32%	24%	7%	5%	31%	74
Percent reduction in total encounters from open all depths to the following depth closures						
Species	Closed >20 fm	Closed >25 fm	Closed >30 fm	Closed >40 fm		
Canary rockfish	43%	28%	23%	16%		
Yelloweye rockfish	67%	43%	36%	31%		

Monthly groundfish directed angler effort was assumed to remain equal to the 2005-07 normalized average unless the fishery season was reduced to less than a May through September season (the five core months). If the season duration was less than May 1 through September 30 the assumption would be that a third of the normal effort during the closed season would be shifted into the open period (the same assumption used in the 2007-08 EIS). Thus, for the May 1 through September 30 option (option 6) it was assumed that the angler effort from the closed period (January 1 through April 30 and October 1 through December 31) would not transfer to the open period as the five core months would be open.

Angler effort in the directed Pacific halibut fishery was assumed to decrease slightly in 2009-10 due to the slight reduction in halibut allocation. The halibut allocation in 2009-10 was assumed to be equal to the 2008 allocation, which is six percent lower than the allocation in 2007. Because the International Pacific Halibut Commission is considering a substantial reduction in the allocation to Area 2A (Washington, Oregon and California) in 2009, an option (option 2) was modeled. The halibut effort and catch in this option was assumed to be reduced by 50 percent and the groundfish fishery was expanded based on the reduced yelloweye rockfish impacts in the halibut directed fishery (total for all Oregon sport fisheries not to exceed 2.5 mt). The decision on the 2009 halibut catch allocation will occur after the 2009-10 groundfish regulations will be set. One potential inseason regulatory change that could result under a reduced halibut allocation is illustrated by option 2.

Model Description

The model design was similar to that used in setting the 2007-08 regulations. The model is housed as an Excel spreadsheet. The model has both landed and discarded fish sections. Each section has similar components although the discarded section also has components to apply both differential mortality rates and average size changes due to various potential offshore closures (i.e., seaward of 20, 25, 30 or 40 fm). Groundfish impacts on yelloweye rockfish and canary rockfish in the Pacific halibut fishery were modeled as a separate fishery. Lingcod landings under the two bag limit options were addressed external to the model.

The model normalized to a 12 month all-depth fishery was used to address impacts from all ocean boat fishery sources, excluding the targeted Pacific halibut fishery. It includes the following components for each species by month: (1) catch; (2) bag limit affects; (3) offshore fishery effects on encounter rates and average size; (4) a 7 percent effort shift to the nearshore fishery due to offshore closures; (5) average size and (6) mortality rates for discarded fish. For landed and discarded fish the methodology to address the affects of various marine bag limits, and offshore closure effects on (a) encounter rates and (b) effort shifts nearshore, were discussed earlier in the report under the Normalization section. Average weight was based on the 2005-07 average landed weight and at-sea observations since 2001 for discarded fish as discussed earlier in this report also under 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 adopted by the PFMC (Table 4-54). Discard mortality rates of 5 percent were applied to lingcod, cabezon and greenling as they do no suffer from barotrauma.

Expected impacts on yelloweye rockfish and canary rockfish in the Pacific halibut fishery were addressed separately. The encounter rate per halibut pound landed in 2005, 2006 and 2007, using the 2002-2003 average weight of fish caught outside of 30-fm, was applied to the 2008 Oregon central coast all-depth halibut sport allocation. The estimated impacts were averaged between the three years to address expected impacts on both species. This assumes similar Pacific halibut allocations in 2009-10 for all but option 2 (see the discussion above under Model Inputs).

Landings and discard impacts for shore and estuary caught species were modeled on a season total basis using the 1998-2002 average metric tons. This fishery will be managed for a year round season as it does not impact yelloweye rockfish and canary rockfish. The metric tons were adjusted for length limits applied to cabezon and greenling since that period (refer to the 2004-05 EIS). Sub-legal cabezon and greenling that were landed in the 1998-2002 period were now considered discards. A mortality rate of 5 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.

Table 4-54. Discard mortality rate calculations for select rockfish species based on sport observer data from 2001 and 2003-07. Mortality rates are predicted for all-depth fisheries and various depth closure scenarios.

2001, 2003-2007 count of released fish by depth bin (fm)							
Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Black rockfish	506	522	29	2	0	0	1,059
Blue rockfish	308	846	87	7	0	0	1,248
Brown rockfish	0	1	0	0	0	0	1
China rockfish	1	7	3	0	0	0	11
Copper rockfish	0	12	1	1	0	0	14
Quillback rockfish	0	3	1	0	0	0	4
Canary rockfish a/	15	295	78	26	21	83	518
Yelloweye rockfish a/	1	24	18	5	4	23	74

Distribution of released fish 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	Total
Black rockfish	48%	49%	3%	0%	0%	0%	1,059
Blue rockfish	25%	68%	7%	1%	0%	0%	1,248
Brown rockfish	0%	100%	0%	0%	0%	0%	1
China rockfish	9%	64%	27%	0%	0%	0%	11
Copper rockfish	0%	86%	7%	7%	0%	0%	14
Quillback rockfish	0%	75%	25%	0%	0%	0%	4
Canary rockfish a/	3%	57%	15%	5%	4%	16%	518
Yelloweye rockfish a/	1%	32%	24%	7%	5%	31%	74

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	Total
Black rockfish	48%	49%	3%	0%	0%	1,059
Blue rockfish	25%	68%	7%	1%	0%	1,248
Brown rockfish	0%	100%	0%	0%	0%	1
China rockfish	9%	64%	27%	0%	0%	11
Copper rockfish	0%	86%	7%	7%	0%	14
Quillback rockfish	0%	75%	25%	0%	0%	4
Canary rockfish	3%	68%	18%	6%	5%	435
Yelloweye rockfish	1%	46%	35%	10%	7%	51

Predicted distribution of released fish when closed outside 30 fm					
Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	Total
Black rockfish	48%	49%	3%	0%	1,059
Blue rockfish	25%	68%	7%	1%	1,248
Brown rockfish	0%	100%	0%	0%	1
China rockfish	9%	64%	27%	0%	11
Copper rockfish	0%	86%	7%	7%	14
Quillback rockfish	0%	75%	25%	0%	4
Canary rockfish	4%	71%	19%	6%	414
Yelloweye rockfish	2%	50%	37%	11%	47

Table 4-54. Discard mortality rate calculations for select rockfish species based on sport observer data from 2001 and 2003-07. Mortality rates are predicted for all-depth fisheries and various depth closure scenarios (continued).

Predicted distribution of released fish when closed outside 25 fm						
Species	≤10 fm	11-20 fm	21-25 fm	Total		
Black rockfish	48%	49%	3%	1,057		
Blue rockfish	25%	68%	7%	1,241		
Brown rockfish	0%	100%	0%	1		
China rockfish	9%	64%	27%	11		
Copper rockfish	0%	92%	8%	13		
Quillback rockfish	0%	75%	25%	4		
Canary rockfish	4%	76%	20%	388		
Yelloweye rockfish	2%	56%	42%	42		
Predicted distribution of released fish when closed outside 20 fm						
Species	≤10 fm	11-20 fm	Total			
Black rockfish	49%	51%	1,028			
Blue rockfish	27%	73%	1,154			
Brown rockfish	0%	100%	1			
China rockfish	13%	88%	8			
Copper rockfish	0%	100%	12			
Quillback rockfish	0%	100%	3			
Canary rockfish	5%	95%	310			
Yelloweye rockfish	3%	97%	24			
Mortality rate						
Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	> 40 fm
Black RF	11%	20%	29%	29%	63%	63%
Blue RF	18%	30%	43%	43%	100%	100%
Brown rockfish	12%	22%	33%	33%	100%	100%
China rockfish	13%	24%	37%	37%	100%	100%
Copper rockfish	19%	33%	48%	48%	100%	100%
Quillback rockfish	21%	35%	52%	52%	100%	100%
Canary RF	21%	37%	53%	53%	100%	100%
Yelloweye RF	22%	39%	56%	56%	100%	100%
Total mortality rate for discarded fish by proposed depth closure						
Species	≤10 fm	≤ 20 fm	≤25 fm	≤30 fm	≤40 fm	All depth
Black rockfish	11%	16%	16%	16%	16%	16%
Blue rockfish	18%	27%	28%	28%	28%	28%
Brown rockfish	12%	22%	22%	22%	22%	22%
China rockfish	13%	23%	27%	27%	27%	27%
Copper rockfish	19%	33%	34%	35%	35%	35%
Quillback rockfish	21%	35%	39%	39%	39%	39%
Canary rockfish	21%	36%	40%	40%	43%	52%
Yelloweye rockfish	22%	38%	46%	47%	51%	66%

a/ Observed retained fish in 2001 and 2003 were included in the analysis.

4.5.1.9 *California Recreational*

The CDFG revised their impact projection model ("RecFish") that was reviewed by the GMT at their January 2008 meeting and at the April 2008 PFMC meeting. The GMT recommends this updated model for use in projecting impacts of groundfish species in 2009–10 California recreational fisheries. This model is described below and is used in impact analyses in this EIS.

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 keep total catch of depleted species within the reduced limits that are necessary to rebuild the stocks while providing fishing opportunity.

Prior to 2000, the recreational daily bag limit for rockfish was 15 fish per angler with 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 analyses of the effects of particular regulations difficult. In addition, regulations have become more region-specific, adding to the difficulty of modeling projected catches.

Methodology Used to Project Recreational Catches for 2009–10

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 2007–08, with revision to the proportion of catch by depth for yelloweye rockfish, percent of catch by month for yelloweye and canary rockfish, division of the North-Central management area into two areas, and use of depth-dependent mortality rates for rockfish of the genus *Sebastes*. The 2005-2007 data from the California Recreational Fishery Survey (CRFS) program serves as a baseline. The model output predicts expected catch under any combination of season and depth fishing restrictions for each of the regions described below:

- Northern Groundfish Management Area: North of 40°10' N latitude to CA/OR border
- North-Central North of Pt. Arena Groundfish Management Area: South of 40°10' N latitude to 38°57' N. latitude (Pt. Arena)
- North-Central South of Pt. Arena Groundfish Management Area: South of Pt. Arena to 37°11' N latitude (Pigeon Pt.)
- South-Central Monterey Groundfish Management Area: South of Pigeon Pt. to 36° N latitude (Lopez Pt.)
- South-Central Morro Bay Groundfish Management Area: South of Lopez Pt. to 34°27' N latitude (Pt. Conception)
- South Groundfish Management Area: South of Pt. Conception to CA/Mexico Border

CDFG/California Recreational Groundfish (RecFish) Model Assumptions

Effort Shift Inshore: The model includes a 27.6 percent increase in expected landings when fishing is restricted to less than 30 fm and a 39.3 percent 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: The GMT developed depth-dependent mortality rates for discarded rockfish of the genus *Sebastes* in 10-fm increments, the derivation of which is described in section 4.1.5.6. The species-specific depth-dependent mortality rates agreed upon by the GMT and approved by the PFMC in 2008 are applied to the discarded fish in the CRFS base data from 2005-07 used in the RecFish model. When projecting the 2009-2010 season catch, discard catch estimates are multiplied by the proportion of catch in a given 10-fm depth increment times the depth-dependent mortality rate for the corresponding depth for each species.

Inputs and Key Parameters for the Model

Weighting of Base Years: Base year data 2005-2007 were given nearly equal weighting by applying a 0.99 decay function. The previous biennial cycle made use of a 0.67 decay function to weight 2005 more heavily than 2004. With the exclusion of the 2004 data in the current model due to issues with the comparability of trip types between years, there are three years of data available for the model and these are weighted nearly equally (2007 = 33.7%, 2006 = 33.3%, 2005 = 33.0%) to represent the base catch in the model.

Base Year Catch: Initially, CRFS catch estimates in weight of fish were summed for caught and retained (CRFS "A" catch), filleted/caught otherwise unavailable ("B1" catch), and for species of concern, a proportion of CRFS reported discarded fish 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 obtain an estimate for what the catch would have been if all months and all depths had been open. This back calculation uses month and depth catch proportions derived from historical catch estimates from seasons unregulated by month and depth.

Historical Catch By Month: Estimates of historical percent catch by two-month period were calculated for each region based on Marine Recreational Fisheries Statistics Survey (MRFSS) data (weight of A+B1) from 1993-99, 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. This percentage was adjusted for yelloweye and canary rockfish in order to reflect the apparent opener effect in recent years, which resulted in increased catch in the months following the season opening and reduced effort later in the year as compared to the historical data. For these two species, the average proportion of catch by month for 2005 and 2006 were used to perform a post-model adjustment to apportion the projected catch for the year to the given months of the season.

Historical Catch by Depth: Estimates of percent catch by depth were calculated for each region based on 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.

To improve the accuracy of catch estimates for yelloweye rockfish, two methods were employed when modeling the effect of depth restrictions on the catch of this species:

1) For expanding baseline input catch data from regulated seasons to all depths, unregulated depth distribution of catch data from other areas can be used to supplement the existing historical data; these data must be from unregulated years to be able to expand to all depths. In the North, data from 1999-2003 were used (years unregulated by depth in the North), recent unregulated Oregon catch by depth (1999-2003), and 1999-2000 data from the North-Central area that is north of Point Arena (for bathymetric and fishing effort similarities to the North). For the North-Central area, additional data from dockside party charter catch by depth data from 1999-2000 were used.

2) More recent catch data from CRFS were used to produce region–specific proportions of catch by depth with a higher sample size than historical data to provide improved projections that represent the current depth distribution of catch. Although this data is from regulated years, recent years have seen a consistent regulatory scheme by depth that would allow for use in apportioning catch by depth within the open depth strata. For example, for the North, the years 2004-2007 saw a consistent 0-30 fm depth restriction in place. The catch by depth for those years was used to project the depth distribution within the upper 30 fm for upcoming years (assuming catch will be restricted to within this zone), providing a more current framework than using the historical 1999-2000 data. Similarly, this applies to 2006-2007 catch by depth data for the North-Central Regions (same 0-30 fm depth restrictions). These depth distributions are applied as a post-model run adjustment, reapportioning the projections with the new depth distributions.

Determining the Proportion of Angler Reported Unavailable Dead Catch for Yelloweye and Canary Rockfish that was Composed of Discarded Dead Fish:

The California Recreational Fisheries Survey program (CRFS) uses several different catch types in generating catch estimates: sampler examined catch (“A”), angler reported unavailable catch including discarded dead (“B1”), and angler reported discarded live catch (“B2”). The B1 category includes disposition such as retained (filleted fish, fish given away, used for bait or otherwise unavailable) and fish discarded dead. Unfortunately, since CRFS began in 2004, no disposition of the B1 catch has been recorded for the majority of private and rental trips which are sampled in the PR1 mode. Therefore, it is not possible to separate the discarded dead fish from the retained unavailable fish in the B1 catch type without use of a proxy for the proportion of fish discarded dead. Attempts have been made to use sparse available data and apply these to the B1 catch data, but little data exists for overfished non-retention species, such as yelloweye and canary rockfish.

To estimate the proportion of B1 catch of yelloweye and canary rockfish that is discarded dead, a “compliance factor” (CF) was determined from recent (2005-2007) CRFS data. The CF is calculated by dividing the B2 catch by the total catch (A+B1+B2); this represents the proportion of fish reported discarded live by anglers (reported live only) while complying with regulations. It is conservative, as a portion of the B1 catch (the discarded dead) in the denominator should be in the numerator. The CF is used as a proxy for the proportion of B1 that is discarded dead, and so it is multiplied by the B1 catch to estimate the total fish discarded dead. This amount is added to the known B2 catch to arrive at total discards. This value is then multiplied by discard mortality factors by depth to obtain the discard mortality. Total mortality is then the retained catch (A+B1, less the proportion of B1 designated discarded dead) + discard mortality. Because the CFs are conservative, the proportions of B1 that are considered otherwise unavailable dead (filleted, used for bait, given away) will be biased high, thereby leading to an estimate of total mortality that is biased high. CFs were determined for each management area for both yelloweye and canary rockfish and applied to the B1 (aggregate unavailable dead catch) catch for these species to provide a conservative proxy estimate of fish discarded dead to which depth dependent mortality rates would be applied in estimating total mortality.

Methodology Used to Calculate Annual Unrestricted Catch

1. Pull (A+B1+B2+B3) 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 percents 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. 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 percent catch for the year that these regulated months represent (from the wave percents 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 RecFish 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.

Projecting Catch from Model Runs

The RecFish model output consists of a matrix for each species or species group and management area. Within each matrix, catch tonnages are generated for each month and 10-fm depth stratum. Following a model run for all months and depths open (with a 0.99 decay value selected), the resulting catch projection values matrix is adjusted by separating out the retained (A+B1) and discarded (B2+B3) catch. The discard tonnages are obtained using 05-07 average discard proportions for each species and multiplying these by the total tonnages obtained from the model. These discard tonnages are multiplied by mortality factors condensed from: 1) GMT-determined mortality rates by depth, and 2) CRFS depth distributions from seasons with identical depth restrictions to expected future seasons. The resulting discard mortality is then recombined with retained catch to obtain total projected mortality. This final matrix is used as a base to project catch by summing catch from selected months and depths open, while also factoring any effort shift effects. In addition, for yelloweye and canary rockfish there are other post-model adjustments for catch by time and depth (see "Inputs and Key Parameters for Model" above).

Subdivision of the North-Central Management Area

Ports south of Point Arena contributed only 2% of the statewide catch of yelloweye rockfish in 2007. In order to prevent the area south of Point Arena from being unnecessarily closed inseason, the North-Central Management Area will be divided into two management areas, the North-Central North of Point Arena Management Area and North-Central South of Point Arena Management Area. Adoption of this line will divide the current North-Central Management Area into two smaller areas.

Depth Restriction Changes

The 20-fm depth restriction will continue in the Northern and North-Central North of Point Arena Management Areas to reduce impacts on yelloweye rockfish. The shallower depth restriction is projected to result in a 33.8% reduction in yelloweye rockfish catch in the North-Central North of Point Arena and a 26.8% reduction in the North Central South of Point Arena. To reduce impacts on Minor Nearshore Rockfish in the North-Central South of Point Arena Management Area, the depth restriction may be increased to 30 fm.

California Recreational Yelloweye Rockfish Conservation Area Analysis

CDFG used 1999-2007 MRFSS/CRFS effort data and CRFS 2006 and 2007 yelloweye catch data (both sampler examined and reported) with latitude and longitude of catch data to identify one square nautical mile blocks with high yelloweye rockfish catch per unit effort from northern California (Pt. Conception to the OR/CA border) using Arc View 9.1. We ascribed the sampled catch of yelloweye rockfish and effort of anglers with rockfish in their catch to the centroid of a given block to determine the catch per unit effort in each 1nm square block. The 2006 CPUE and a conglomerate data set of 1999-2007 CPUE were plotted to identify other potential yelloweye rockfish hotspots that we may have missed using only 2007 data.

We identified many areas in the North and North-Central Management Area North of Point Arena that have high yelloweye catch. Three criteria were used in identifying areas for further analysis of potential catch savings from YRCAs:

- High yelloweye catch per unit effort within a given 1 nm square block.
- Clustering of high catch per unit effort blocks in the same area.
- Repeated presence of high catch per unit effort among years.

The following sections discuss the catch savings estimation methods and areas identified as prospective YRCAs for in-state waters alone and for areas in both state and federal waters.

Yelloweye Rockfish Conservation Areas Previously Proposed in State Waters for 2008

The YRCAs developed for use during the 2008 season could only be implemented in state waters since analysis of these areas was not included in the 2007-08 EIS. This precluded the inclusion of high yelloweye catch per unit effort areas in federal waters. To compensate for the inability to close areas where high numbers of yelloweye rockfish are known to occur, larger areas within state waters were identified (see the California Recreational portion of section 2.2.4.2). These areas included large enough portions of the fishable grounds in the vicinity of a given port that the assumption could be made that the effort inside the YRCA would not be redistributed, but instead would be lost from a given port. Thus the catch savings from these areas were calculated as:

Catch Savings = yelloweye catch for the port * (proportion of the catch occurring within the YRCA).

Yelloweye Rockfish Conservation Areas in State and Federal Waters Proposed for 2009-2010

The 2009-2010 EIS development provided the opportunity to identify areas with high catch per unit effort in federal as well as state waters since the analysis could be included in the FEIS and be available for use in the 2009-2010 seasons. This allowed smaller areas with higher catch per unit effort in federal and state waters to be placed in YRCAs. These areas are sufficiently small that it is likely that anglers would redistribute their fishing effort to areas outside the YRCA in the vicinity of the port. Thus the catch savings resulting from the YRCAs in state and federal waters were calculated as:

> Percent Catch Reduction from YRCA Implementation = ((sampled yelloweye catch for the remaining ports in the management area +((sampled yelloweye catch for the port * (1-the proportion of sampled yelloweye catch within the YRCA) * (1+ the proportion of effort with rockfish in the catch within the YRCA))) / sampled yelloweye catch for the management area.)*100.

The catch reductions were calculated using yelloweye catch data from the 2007 CRFS database. The catch outside the YRCA under analysis but within 20 fm was increased by 9% prior to calculation of catch reductions to account for the reduction in the depth restriction from 30 fm in 2007 to 20 fm in the 2008 season. Accounting for this effort shift reduced the amount of catch reduction from implementation of the YRCAs, making the estimate more conservative. The sum of the YRCAs independently implemented for a given port result in less savings than if both are implemented since effort from the YRCA that is implemented could be shifted to the other area of high catch that is in the unimplemented YRCA area. For example, there is a 17% catch reduction for the Northern Management Area from implementing both the Point Saint George and South Reef YRCA off of Crescent City, but only an 8% and 6% catch reduction from closing only Point Saint George or only South Reef because effort from one area of high catch can be shifted onto another area of high catch if both are not closed. The estimated percent reduction in yelloweye rockfish catch from the implementation of each YRCA and combined use of YRCAs by management area are provided in Table 4-55.

Table 4-55. Estimated percent yelloweye catch reduction from the implementation of YRCAs and combinations of YRCAs.

Yelloweye Rockfish Conservation Area	Management Area	Port of Origin	Percent Reduction in Management Area Yelloweye Catch
Point Saint George	Northern	Crescent City	8%
South Reef	Northern	Crescent City	6%
Redding Rock	Northern	Trinidad	30%
Point Delgada North	North-Central North of Pt. Arena	Shelter Cove	6%
Point Delgada South	North-Central North of Pt. Arena	Shelter Cove	32%
Point Saint George and South Reef	North-Central North of Pt. Arena	Crescent City	17%
Point Delgada North and South	North-Central North of Pt. Arena	Shelter Cove	49%
All Northern Management Area YRCAs	Northern	Crescent City / Trinidad	47%
All North-Central North of Pt. Arena Management Area YRCAs	North-Central North of Pt. Arena	Shelter Cove	49%

The latitudes and longitudes that delineate the proposed YRCAs for possible use in the 2009-10 seasons are provided in the California Recreational portion of section 2.2.4.2.

Analyzing the Effectiveness of the Sanddabs and Other Flatfish Gear Restriction Regulation

Sanddabs and Other Flatfish are allowed to be taken in the California recreational fishery when fishing for rockfish, lingcod and associated species (referred to as the RCG complex below for simplicity) are closed. Starting in 2004 the following regulations were placed on sanddabs and Other Flatfish fishery to reduce bycatch of "overfished" species:

> *The use of weight no more than 2 pounds and no more than 12 hooks size 2 or less while fishing for sanddabs and Other Flatfish during the months in which the RCG complex is closed.*

There is concern that this is the standard gear used for targeting sanddabs regardless of whether rockfish is open or closed and that the restrictions do not offer additional protection to rockfish. Additionally, both CRFS samplers and party boat operators indicate that the by-catch of rockfish while fishing for sanddabs and Other Flatfish is minimal.

The objective of this analysis is to compare the bycatch of rockfish (the primary species of concern associated with fisherman who are targeting sanddabs and Other Flatfish) when there were no gear restrictions to years when the restrictions were put in place, focusing on four rockfish species of concern: bocaccio, canary rockfish, cowcod, and yelloweye rockfish. The goal is to determine if the gear restrictions reduce the bycatch of rockfish in the recreational fishery for sanddabs and Other Flatfish. If not, the gear restrictions may be unnecessary and could potentially be eliminated, simplifying the ocean sport fish regulations.

Using the CRFS database for 2004-07 and the MRFSS database for 2001-03, relevant data were extracted pertaining to all catch events in which sanddab species group was targeted. The data were compiled in Microsoft Access. All species that were caught in association with sanddab as a targeted species group during the months in which the Rockfish, Cabezon and Greenling (RCG) complex was closed were queried for 2004 through 2007. Data were stratified into the northern California (Oregon/California border to Point Conception) and southern California (Point Conception to the U.S.-Mexico border) areas. Data were further stratified by party/charter boats (PC) and private/rental boats (PR). The same data extraction and query was made using the MRFSS data base for 2001 through 2003. A comparison of the by-catch was made between the seasons with no gear restrictions (2001-03) and the seasons when the restrictions were in place (2004-07). It was assumed that anglers were using the required gear when fishing for sanddabs.

Table 4-56 shows that before the sanddab gear restrictions were in place, there was little to no catch association of species of concern when sanddabs were the targeted species. While there were some catch events for bocaccio south of Point Conception and yelloweye rockfish north of Point Conception these encounters were infrequent while fishing for sanddabs. The results for the bycatch of species of concern during the time when the gear restrictions were in place showed little to no catch of those species. The results indicate that sanddabs and Other Flatfish fishery gear restrictions have not shown to be effective in restricting the bycatch of the rockfish species of concern.

Table 4-56. Numbers of fish and ratios of rockfish species of concern to sanddabs before and after gear restriction regulations.

Prior to Gear Restrictions									
Year	Numbers of Fish Sampled					Bycatch Ratio to Sampled Sanddabs			
	Sanddabs	Bocaccio	Canary	Cowcod	Yelloweye	Bocaccio	Canary	Cowcod	Yelloweye
Northern California PC Boats									
2001	No data	NA	NA	NA	NA	NA	NA	NA	NA
2002	1,657	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	2,984	0	0	0	0	0.0000	0.0000	0.0000	0.0000
Northern California PR Boats									
2001	210	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2002	324	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	220	0	0	0	0	0.0000	0.0000	0.0000	0.0000
Southern California PC Boats									
2001	309	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2002	2,528	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	1,743	0	0	0	0	0.0000	0.0000	0.0000	0.0000
Southern California PR Boats									
2001	42	1	0	0	0	0.0238	0.0000	0.0000	0.0000
2002	494	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	740	0	0	0	0	0.0000	0.0000	0.0000	0.0000

After Gear Restriction Regulations									
Year	Numbers of Fish Sampled					Bycatch Ratio to Sampled Sanddabs			
	Sanddabs	Bocaccio	Canary	Cowcod	Yelloweye	Bocaccio	Canary	Cowcod	Yelloweye
Northern California PC Boats									
2004	4,183	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2005	967	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2006	1,383	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2007	575	0	1	0	0	0.0000	0.0017	0.0000	0.0000
Northern California PR Boats									
2004	2,837	0	0	0	2	0.0000	0.0000	0.0000	0.0007
2005	952	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2006	963	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2007	1,037	0	3	0	0	0.0000	0.0029	0.0000	0.0000
Southern California PC Boats									
2004	2,522	5	0	0	0	0.0020	0.0000	0.0000	0.0000
2005	3,175	1	0	0	0	0.0003	0.0000	0.0000	0.0000
2006	900	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2007	3,439	2	0	0	0	0.0006	0.0000	0.0000	0.0000
Southern California PR Boats									
2004	598	1	0	0	0	0.0017	0.0000	0.0000	0.0000
2005	676	2	0	0	0	0.0030	0.0000	0.0000	0.0000
2006	1,351	1	0	0	0	0.0007	0.0000	0.0000	0.0000
2007	1,158	2	0	0	0	0.0017	0.0000	0.0000	0.0000

Bag Limit Analyses

Rockfish Cabezon and Greenling (RCG) Bag Limit

A six fish bag limit is being considered for Northern and North-Central North of Point Arena Management Area to reduce impacts on yelloweye rockfish. The RCG Bag Limit Reduction analysis was done using the Bag Frequency Analysis tool available on the RecFIN web site available at http://www.psmfc.org/recfin/forms/bfreq.html. The parameters selected in the analysis were based on past analysis of bag limit reduction by species. The species chosen were all rockfish, kelp greenling, cabezon with a 10 fish bag limit. The marine area selected was all areas shoreward of 3 nm. Three modes were analyzed separately: Party and Charter mode, Private and Rental mode, and Shore mode. In the Data type parameters, “split shared angler bags” was selected and the catch type was A+B1+B2: total catch. Counties selected were based on the counties within their respective Management Areas. The analysis looked at two areas, the Northern and North-Central Management Area North of Pt. Arena. The range of Hypothetical Bag Limits analyzed was 10 to 3 fish for RCG. The years used in the analysis were 2005-07.

Once the parameters were set, the analysis was conducted and the results were used to calculate total % catch reduction for a reduced bag limit. The total catch for each bag limit from 10 fish down to 3 fish were subtracted by the total catch of the current 10 fish bag limit regulation. The result was divided by the current 10 fish bag limit total catch number and multiplied by 100 to provide a percent reduction in catch resulting from a given bag limit. The resulting catch reductions for the private rental and party charter modes can be seen in Table 4-57.

A six fish bag limit is estimated to result in a 20% reduction in the RCG catch for the private rental mode and a 26% catch reduction in the party charter mode in the Northern Management Area. The majority of the rockfish catch in California originates from the PR and the 20% catch reduction is used as the proxy for catch reduction for all modes in calculating the catch resulting from a 6 fish bag limit in the Northern Management Area and the North-Central Management Area North of Pt. Arena. This analysis accounts for only the catch reduction due to the reduction in retained fish by a given angler, it does not account for reductions in effort due to the reduced opportunity represented by the lower bag limit which could further reduce catch. This analysis does not account for the possibility of increased discarding with lowered bag limits as anglers become more selective with regard to the fish they retain.

Table 4-57. Percent reductions in the RCG catch resulting from reductions in the bag limit from the current 10 fish bag limit for the Private Rental and Party Charter Modes in the Northern and North-Central Management Areas.

Bag Limit	Private and Rental Percent RCG Catch Reduction	Party Charter Percent RCG Catch Reduction
9	3%	5%
8	8%	11%
7	14%	18%
6	20%	26%
5	28%	35%
4	38%	45%
3	48%	56%

Bocaccio, Greenling, and Cabezon Bag Limit Analyses

Alternative 2009-10 bag limits include an increase in the greenling and cabezon bag limits from one to two fish. CDFG used the RECFIN methodology for Hypothetical Bag Limit Analyses to determine increased impacts on greenlings and cabezon resulting from this change. We used 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 greenlings and cabezon that B1 includes filets and there were no fish thrown back dead as kelp greenlings and cabezon 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. Results show a consistent increase in expected catch for the private/rental mode for both species, as well as increases in catch for cabezon shore modes (Table 4-58).

An alternative 2009-10 bocaccio bag limit 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.

Conversely, an alternative bocaccio bag limit 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 to determine increased impacts on bocaccio resulting from this change. The program uses the A+B1+B2 fish from 2005-07 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. B2 fish were included as CDFG assumed most of the B2 fish were regulatory discards after the angler had already caught one bocaccio. All bags over the hypothetical limit are then set to the hypothetical limit to calculate increased take. The increased estimated impacts on bocaccio are strongly pronounced in the private/rental mode south of Pigeon Pt., especially in the Southern Management Area, and in the party/charter mode in the Southern Management Area (Table 4-58)

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.

Table 4-58. Results of analyses of bag limit changes for bocaccio, greenlings, and cabezon.

Expected % increase in catch from 1 to 2-fish bag limit by fishing mode and management area

	Bocaccio		Greenlings		Cabezon			
	Fishing Mode							
Management Area	PC	PR	PC	PR	PC	PR	MM	BB
North	-	-	33	34	0	44	5	75
North-Central N of Pt Arena	0	0	0	47	0	20	14	0
North-Central S of Pt Arena	8	0	0	21	8	24	23	17
South-Central - Monterey	3	33	0	38	0	21	13	0
South-Central - Morro Bay	7	25	0	40	8	37	0	0
South	29	63	0	0	3	24	20	20

(PC = Party/Charter, PR = Private/Rental, MM = man-made structures, BB = beach/bank)

2009/2010 Ocean Whitefish Analysis

The objective o the ocean whitefish analysis is to determine rockfish bycatch rates associated with fisherman who are targeting ocean whitefish in southern California in the months of January and February (when rockfish is closed in southern California). Bocaccio is one species of concern that was looked at closely in this analysis. Due to a decline in bocaccio over the last 20 years, mostly because of commercial and recreational bycatch, regulations have become tighter over the years to protect them.

The methodology for this analysis is as follows:

1) A query was run to obtain the catch per angler for anglers whose primary target was Ocean White Fish for Private/Rental and Party/Charter modes for all months of 2005-2007, using the summarized RecFIN Survey Sample data site, version 3 (http://www.recfin.org/forms/samp3.html).

2) The average weight of discards over the entire period for A (sampler examined) fish were obtained. Since there are no weights available for B1 (angler reported retained) or B2 (angler reported discarded dead) fish, we will make an assumption that the average weight of A fish was the same for B1 and B2 fish. The average weight of A fish was obtained (in kg) for the time of 2005-07 using the summarized RecFIN Survey Sample data Version 3. The weight in kilograms was converted to metric tons.

3) The average effort for bottomfish trip type for December and March for 2005-07 was queried using the Summarized Marine Recreational Estimates tool on the RecFIN website (http://www.recfin.org/forms/est2004.html). The months of December and March were selected to represent January and February as a proxy estimate of effort.

Thus, we can multiply the A weight by the number of fish per angler and then multiply this by the average effort for the bottomfish trip type for Dec and March for 2005-07 to obtain a proxy estimate of the total catch. This will most likely be an overestimate because of the assumption that the average effort for bottomfish trip type will be representative of the effort for Ocean Whitefish. It will also be biased high because the average weight of A fish will probably be higher than those that were thrown back.

The analysis shows a high level of rockfish caught in association with ocean whitefish as a target trip type. In both boat fishing modes (Party/Charter and Private/Rental) the percentage of rockfish to the total catch was extremely high. For example, the Party and Charter mode rockfish catch made up 40% of the total catch (Figure 4-19), and the Private and Rental mode rockfish catch was 38% of the total catch Figure 4-20).

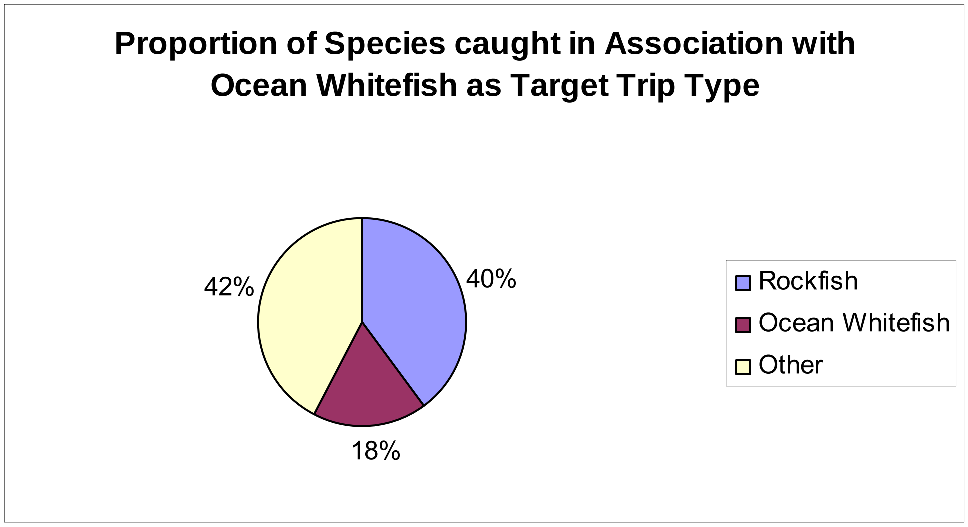


Figure 4-19. The proportion of rockfish and other species caught in association with Ocean Whitefish for Party and Charter boats from 2005-07.

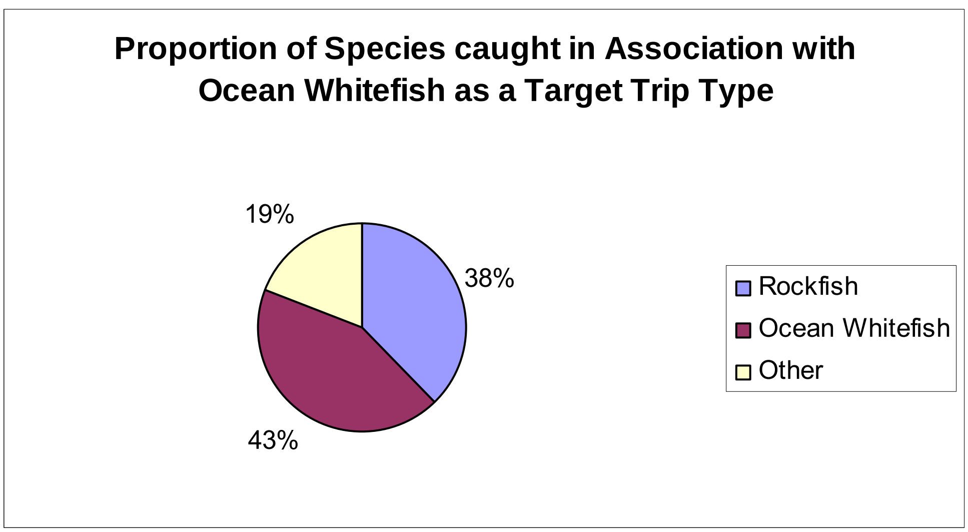


Figure 4-20. The proportion of rockfish and other species caught in association with ocean whitefish for Private and Rental boats from 2005-07.

The high percentage of rockfish caught when targeting ocean whitefish may mean that ocean whitefish targeted trips are not efficient at catching ocean whitefish and could cause more problems in the future with this high bycatch of rockfish.

Specifically, one species of concern as bycatch for ocean whitefish trip types is bocaccio. The analysis shows that an estimation of 3.61 mt of bocaccio will be caught in association with ocean whitefish as a trip target type in Party and Charter mode for the combined months of January and February. The bocaccio harvest guideline (HG) for the state of California for 2009-10 is 66.3 mt. This bycatch of 3.61 mt is 5% of the total HG for 2009/2010. If statewide bocaccio catch levels closely approach HGs, the effects of ocean whitefish trips on bocaccio catch levels may preclude opening ocean whitefish seasons during January and February in southern California.

Lingcod-Yelloweye Rockfish Associations

One measure under consideration for the 2009-10 groundfish management cycle involves a decrease in the lingcod recreational and commercial minimum size limit from 24 inches to 22 inches. This measure is being considered for areas in the northern part of the state to help relieve fishing pressure on yelloweye rockfish, an overfished species. In analyzing the potential effects of this measure, it is necessary to understand the relationship between lingcod catch and yelloweye rockfish bycatch.

Yelloweye rockfish is the primary overfished species of concern in California, and there is concern that recreational boat-based trips catching lingcod have relatively high yelloweye rockfish encounter rates. The California yelloweye rockfish OY catch-sharing option has yet to be finalized by the Council; however, regardless of which option is chosen for California, yelloweye rockfish will continue to be the most constraining species for the state. Lowering the encounter rate of this species will ultimately lead to more fishing opportunities for the public.

The objective of this analysis is to determine the amount of yelloweye rockfish encountered on recreational boat-based trips where lingcod are caught. The goal is to determine the extent of association between these two species.

This analysis involved two parts. Both parts used RecFIN sample data from the CRFS database. For the purposes of this study:

- All catch data are from recreational sector boat-based anglers using primarily hook-and-line gear from all marine areas north of Point Sal, Santa Barbara County.
- Encounter is defined as an angler interaction with a fish, either harvested or released.
- Catch is defined as all fish caught by the fishing gear of the angler and brought to the surface for removal. A catch event is the same as an encounter.
- Landed is defined as the harvested catch examined by a fisheries sampler ("A" catch).
- Released is defined as the bycatch "let go" by anglers that was reported to a fisheries sampler in either alive or dead condition ("B2" and "B1" catch).

Part 1: To get an idea of the number of yelloweye rockfish encountered relative to the number of lingcod encountered, sample data were extracted pertaining to all catch events in which lingcod was represented (A, sampler-examined catch, or B1+B2, angler-reported catch). The 2004-07 sample data were extracted for the CRFS districts north of Point Sal (Redwood, Wine, San Francisco, and Central). Data were arranged by target species (not necessarily lingcod) and year. A sum of the number of fish harvested or released was calculated for lingcod and yelloweye rockfish by year, district and fishing mode (party/charter or private/rental). CRFS districts were then reconfigured into CDFG Management Areas (Northern, North-Central, and South-Central). A ratio of yelloweye rockfish catch to lingcod catch was determined for each criteria mentioned above.

These data only include trips where lingcod were represented in the catch, regardless of target species. Trip target species was not of concern because associations can occur regardless of what fish anglers target. However, using the straight sample data from RecFIN does not allow analysis by trip ID. True associations between species have to be somewhat inferred because there is no way to link catches of lingcod and yelloweye rockfish within the same trip (e.g. there may have been 20 lingcod and zero yelloweye rockfish caught on trip X, but only one lingcod and 20 yelloweye rockfish caught on trip Y). Therefore, this method is a "quick and dirty" analysis.

Part 2: To get a better idea of the number of yelloweye rockfish encountered relative to the number of lingcod encountered, sample data were extracted from an Access database where data is linked by trip ID. 2005-2007 lingcod and yelloweye rockfish data were pulled from this database for all sampler-examined catch (A). The same was done for all angler-reported catch (B1+B2). The two outputs were then combined to give all trips where lingcod *and* yelloweye were encountered (both species on the same trip). Final data were arranged and analyzed in the same format described above under Part 1: by year, district and mode. A ratio of yelloweye rockfish catch to lingcod catch was determined for each criteria mentioned above.

Table 4-59 shows the catch ratios of yelloweye rockfish to lingcod to be much higher in the Redwood and Wine CRFS Districts, corresponding to the Northern Management Area and the portion of the North-Central Management Area north of Marin County, respectively. The Central CRFS District, or the South-Central Management Area, has much lower yelloweye rockfish-to-lingcod catch ratios. In fact, yelloweye rockfish catch in relation to lingcod catch south of San Francisco is very low. Yellow shading depicts ratios of yelloweye rockfish to lingcod of 1:10 or greater.

Both party/charter (PC) and private/rental (PR) boat modes in the Redwood and Wine Districts have relatively high yelloweye rockfish-to-lingcod catch ratios. In the Northern Management Area, more yelloweye rockfish were encountered on PR trips, whereas in the North-Central Management Area, the majority of yelloweye rockfish were encountered on PC trips; however, PR trips were also high. The years 2007 and 2006 show the highest associations between yelloweye rockfish catch and lingcod catch.

The more complete analysis with the Access database shows a similar trend as in Part 1; however the ratios of yelloweye rockfish to lingcod are much higher. Table 4-60 shows yelloweye rockfish are caught at least half as often as lingcod for the northern part of the state. In many instances, yelloweye rockfish were caught as often as lingcod, sometimes twice as often, and in one case, five times as often as lingcod. The most robust sample sizes come from the PR mode. In the PR mode north of Pigeon Point, the catch rates of yelloweye to lingcod are well above the 50% mark in 2006 and 2007. In 2007 specifically, the catch ratios were well above 1:1. This more thorough analysis also shows a greater association between these two species in the South-Central Management Area and in the southern portion of the North-Central Management Area (San Francisco). Bold values depict ratios of yelloweye rockfish to lingcod of 1:2 or greater (i.e. where yelloweye rockfish were caught at least half the time). Italicized values represent at least a 1:1 ratio, and values surrounded in bold borders represent ratios of at least 1:1 where the sample sizes are robust.

Figures 4-21 and 4-22 are Venn diagrams of the sampler-examined and angler-reported data, respectively, showing the number of lingcod caught, and the number of yelloweye rockfish caught for the period of 2005-07. From 2005-07, fisheries samplers examined 172 yelloweye rockfish; 76% of those fish were caught in conjunction with landed lingcod.

The results for the yelloweye rockfish bycatch analysis show that, at least in the northern portion of the state, lingcod catch (harvested and released) is highly associated with yelloweye rockfish encounters. This has been especially true for the past two groundfish seasons. Lowering the recreational lingcod minimum size limit to 22 inches may get anglers off the water sooner (by meeting their bag limit in less time), thus decreasing the amount of yelloweye rockfish encounters. However, a lower size limit might persuade more anglers to participate in the lingcod fishery as a whole, landing more fish. More lingcod caught by boat-based anglers will ultimately mean more yelloweye rockfish caught as well.

Table 4-59. Sampler examined and angler reported harvested and released numbers of counted fish sampled from marine recreational anglers using all gear by year for all boat based fishing in all marine areas for trips where filtered species: lingcod were caught for districts 6-3 (Redwood, Wine, SF, Central) for January 2004 - December 2007.

Management Area	CRFS District by Mode & Year						
Northern	Redwood PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD	*All trips contain lingcod (AB1B2), some trips targeted lingcod, others just included lingcod as AB1B2		
	2004	224	7	0.0313			
	2005	123	1	0.0081			
	2006	287	11	0.0383			
	2007	381	53	**0.1391**			
	total	1015	72	0.0709			
	Redwood PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD			
	2004	3941	168	0.0426			
	2005	5181	199	0.0384			
	2006	4618	556	**0.1204**			
	2007	3636	857	**0.2357**			
	total	17376	1780	0.1024			
North-Central	Wine PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD	# LNGCD	# YE	Ratio of YE to LNGCD
	2004	171	2	0.0117	636	2	0.0031
	2005	43	2	0.0465	487	0	0.0000
	2006	48	2	0.0417	524	2	0.0038
	2007	32	7	**0.2188**	425	3	0.0071
	total	294	13	0.0442	2072	7	0.0034
	Wine PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD	# LNGCD	# YE	Ratio of YE to LNGCD
	2004	2158	20	0.0093	4433	20	0.0045
	2005	2496	59	0.0236	6071	63	0.0104
	2006	2569	155	0.0603	6422	180	0.0280
	2007	923	155	**0.1679**	2241	161	0.0718
	total	8146	389	0.0478	19167	424	0.0221
	San Fran PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD	The North-Central Management Area = District Wine + District SF		
	2004	465	2	0.0043			
	2005	444	0	0.0000			
	2006	476	2	0.0042			
	2007	393	3	0.0076			
	total	1778	7	0.0039			
	San Fran PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD			
	2004	2275	0	0.0000			
	2005	3575	4	0.0011			
	2006	3853	25	0.0065			
	2007	1318	6	0.0046			
	total	11021	35	0.0032			

Table 4-59. Sampler examined and angler reported harvested and released numbers of counted fish sampled from marine recreational anglers using all gear by year for all boat based fishing in all marine areas for trips where filtered species: lingcod were caught for districts 6-3 (Redwood, Wine, SF, Central) for January 2004 - December 2007 (continued).

Management Area	CRFS District by Mode & Year			
	Central PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD
	2004	1151	0	0.0000
	2005	634	32	0.0505
	2006	169	0	0.0000
	2007	232	1	0.0043
South-Central	total	2186	33	0.0151
	Central PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD
	2004	6932	1	0.0001
	2005	4254	10	0.0024
	2006	4105	1	0.0002
	2007	2234	3	0.0013
	total	17525	15	0.0009

Table 4-60. Sampler examined and angler reported harvested and released numbers of counted fish sampled from marine recreational anglers using all gear by year for all boat-based fishing in all marine areas for trips where lingcod were caught with yelloweye rockfish for districts 6-3 (Redwood, Wine, SF, Central) for January 2005 – December 2007.

Management Area	CRFS District by Mode & Year				
Northern	Redwood PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD	Data are for boat-based (linked) trips with all gear types in marine waters where both lingcod **and** yelloweye rockfish were encountered (AB1B2)
	2005	0	0	0.0000	
	2006	6	9	*1.5000*	
	2007	17	27	*1.5882*	
	total	23	36	1.5652	
	Redwood PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD	
	2005	288	140	0.4861	
	2006	619	418	**0.6753**	
	2007	514	500	**0.9728**	
	total	1421	1058	0.7445	Wine+ SF

Table 4-60. Sampler examined and angler reported harvested and released numbers of counted fish sampled from marine recreational anglers using all gear by year for all boat-based fishing in all marine areas for trips where lingcod were caught with yelloweye rockfish for districts 6-3 (Redwood, Wine, SF, Central) for January 2005 – December 2007 (continued).

	Wine PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD	# LNGCD	# YE	Ratio of YE to LNGCD
	2005	4	2	**0.5000**	4	2	**0.5000**
	2006	1	1	*1.0000*	3	2	**0.6667**
	2007	1	5	*5.0000*	3	6	*2.0000*
	total	6	8	1.3333	10	10	1.0000
	Wine PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD	# LNGCD	# YE	Ratio of YE to LNGCD
	2005	86	49	**0.5698**	86	49	**0.5698**
	2006	151	115	**0.7616**	178	132	**0.7416**
	2007	70	104	1.4857	83	109	1.3133
North-Central	total	307	268	0.8730	347	290	0.8357
	San Fran PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD	The North-Central Management Area = District Wine + District SF		
	2005	0	0	0.0000			
	2006	2	1	**0.5000**			
	2007	2	1	**0.5000**			
	total	4	2	1.0000			
	San Fran PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD			
	2005	0	0	0.0000			
	2006	27	17	**0.6296**			
	2007	13	5	0.3846			
	total	40	22	0.5500			
	Central PC Boats	# LNGCD	# YE	Ratio of YE to LNGCD			
	2005	0	0	0.0000			
	2006	0	0	0.0000			
	2007	0	0	0.0000			
	total	0	0	0.0000			
South-Central	Central PR Boats	# LNGCD	# YE	Ratio of YE to LNGCD			
	2005	3	1	0.3333			
	2006	6	1	0.1667			
	2007	3	2	0.6667			
	total	12	4	0.3333			

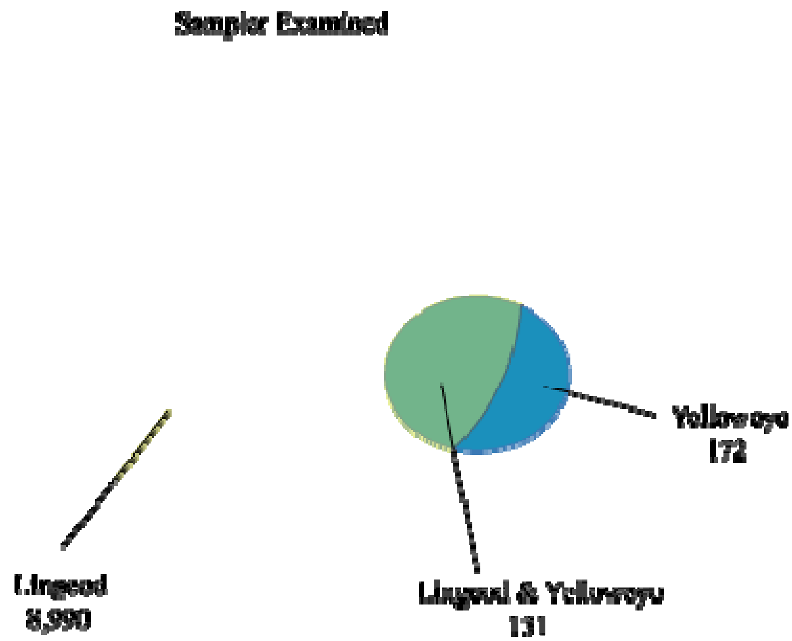


Figure 4-21. Sampler-examined catch in number of fish (harvested and released) for lingcod and yelloweye rockfish.

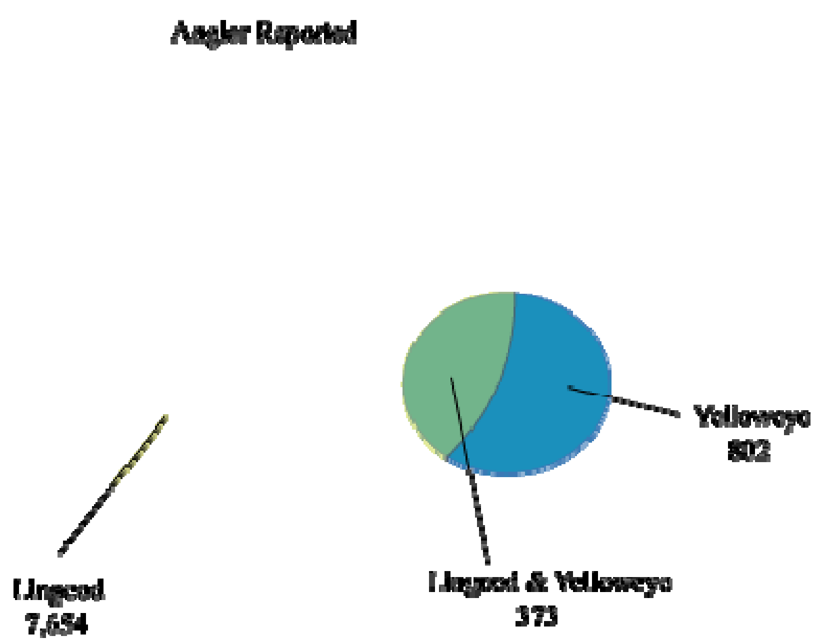


Figure 4-22. Angler reported catch in number of fish (harvested and released) for lingcod and yelloweye rockfish.

4.5.2 Impacts of Management Measure Alternatives by Sector

4.5.2.1 *Limited Entry Non-Whiting Trawl*

The alternative trip limits and RCA configurations for the non-whiting trawl sector designed to stay within the constraints imposed by the rebuilding alternatives are described in section 2.1.1.8.

One Bottom Trawl Gear on Board North of 40°10' N Latitude

The intention of the one bottom trawl gear on board is to increase the certainty that large footrope gear is not being used shoreward of the Rockfish Conservation Area (RCA). Large footrope is better able to fish in rocky habitats and using this gear in shoreward areas tends to increase bycatch of overfished species found on the shelf. Additionally, allowing a vessel to fish only one bottom trawl net type has been viewed as a potential way to more accurately predict target fishery participation. The bycatch model estimates depleted species' impacts, shoreward and seaward of the RCA. Allowing only one bottom trawl net type to be used, or aboard the vessel, during an entire cumulative fishing period is one way of achieving a more accurate prediction.

If a vessel chooses to use multiple bottom trawl gears during one trip, there could be trip limit enforcement concerns. Cumulative limits are applied to the most restrictive gear used during the period. Common practice is to record the gear which caught the most fish (i.e., dominant gear) on the landing receipt, when multiple gear types are used. If most of the trip employs a less restrictive gear and the fish ticket only reflects the dominant gear, then enforcing the proper cumulative limit could become problematic.

Additionally, sampling concerns are associated with the use of multiple trawl gears during one trip and implementation of a one trawl gear onboard regulation would resolve these concerns. Fish are not kept in separate holds by gear type and therefore samples taken at the dock cannot be associated to a specific gear or area fished (shoreward or seaward of the RCA). Gear and area codes cannot be recorded on fish tickets and logbooks when more than one gear is used. When samples cannot be linked to the gear and area fished, they are unable to be used, which results in a loss of important information used in stock assessments.

No data are available to inform the number of vessels or trips where multiple trawl gears are on board a vessel. However, landing summaries indicate the number of trips where multiple gears have been used. In Washington and California, samplers rarely see multiple trawl gears used during one trip (even though vessels may have two gears on board). From 2005-07, approximately 2.7% of Oregon landings were composed of trips where multiple gears were used (Table 4-61). The number of trips where multiple gears were used has declined in recent years. Using multiple gears on one trip primarily occurs in Astoria (Table 4-62).

Table 4-61. Number of non-whiting trawl trips using multiple gear landed into Oregon.

Year	Number of Multiple Gear Trips	Total Number of Bottom Trawl Trips	% Multiple Gear Trips
2005	28	1,040	2.69%
2006	32	1,119	2.86%
2007	18	689	2.61%

Table 4-62. Number of non-whiting trawl trips using multiple gear landed into Astoria, Oregon.

Year	Number of Multiple Gear Trips	Total Number of Bottom Trawl Trips	% Multiple Gear Trips
2005	27	466	5.79%
2006	30	550	5.45%
2007	18	300	6.00%

Several issues were identified with a one trawl gear provision. If trawlers are held to a single trawl gear during a period, this may inadvertently result in increased trawl effort on the shelf for those vessels that currently fish both seaward and shoreward but are restricted to the smaller limits. Based on historical practices, if a one gear on board provision was adopted, it would primarily constrain Oregon vessels, and particularly those vessels in Astoria. In addition, switching between one trawl gear and another may force vessels to incur a cost that they currently do not incur, thus having an adverse economic impact to trawl vessels. Anecdotal evidence indicates that the cost to switch nets ranges from approximately $100 to $300.

4.5.2.2 *Limited Entry Whiting Trawl*

The implications to 2009-10 whiting fisheries posed by alternative widow rockfish OYs are described in section 2.1.1.8.

Bycatch limits have been used to constrain the incidental catch of overfished rockfish species in the non-tribal Pacific whiting fishery (i.e., all sectors) since 2004 (Table 4-63). If a bycatch limit is reached, all commercial Pacific whiting fisheries are closed for the remainder of the year, regardless of whether or not the Pacific whiting allocations have been reached. This catch management tool has been used to prevent exceedance of ABCs and OYs and also to prevent harm to other fishery sectors that may be impacted by higher than expected catch amounts of bycatch species.

Table 4-63. Range of Overfished Species Bycatch Limits (mt) set by the Pacific Fishery Management Council for the non-tribal Pacific whiting fishery.

Species	2004	2005	2006	2007	2008
Canary	6.2 – 7.3	4.7	4.0 – 4.7	4.7	4.7
Darkblotched	9.5	n/a	25	25	40
Widow	n/a	200 – 212	200 – 220	220 – 275	275 a/
a/ Year 2008 values represent the numbers currently outlined in the Federal Regulations, which can be modified by the Council during inseason action.					

Historically, the Council has adopted the ABC/OY of Pacific whiting while taking into account bycatch projections, in order to promote harvesting of the whiting OY relative to overfished species constraints. This performance standard approach has worked well. However, in 2007, the non-tribal Pacific whiting fishery was closed when the widow bycatch limit for all sectors was exceeded. This was the first time the non-tribal whiting fishery had been closed upon attainment of a bycatch limit prior to achieving the whiting OY. The fishery did reopen on October 7, 2007 after the Council increased the widow cap from 220 to 275 mt (72 FR 56664, October 4, 2007).

In response to the early season closure, the Council requested the analysis of several bycatch limit management measures for the non-tribal Pacific whiting fishery including 1) sector-specific bycatch caps, 2) seasonal releases of bycatch limits, 3) closing the fishery upon attainment of a bycatch limit, and 4) depth-based restrictions as an inseason measure upon the projected attainment of one or more bycatch caps for canary rockfish, widow rockfish, and darkblotched rockfish or the Chinook harvest guideline. The goal of these management measures is to reduce cross-sector competition and reduce the race-for-bycatch and to reduce bycatch.

2009-10 Area Restriction Alternatives

In order to assess the effects of Rockfish Conservation Areas in the whiting fishery, bycatch rates were calculated by sector and by depth. This data was taken from at-sea observers in the at-sea fishery, and from logbook data in the shoreside fishery. Bycatch rates are defined as the poundage of overfished species taken per pound of whiting. These bycatch rates were applied to each sector's allocation of a hypothetical 250,000 metric ton whiting OY to simulate the possible effects of implementing RCAs on the whiting fishery. Depth contours of 100, 125, and 150 fm were analyzed.

This bycatch rate analysis suggests that it is not unequivocally the case that deeper depths result in less bycatch. In fact, for widow and darkblotched deeper depths may actually result in a higher rate, while canary and yelloweye rates and associated catch may decrease at depths greater than 150 fm. These rates and their implications appear to vary by sector as well. Table 4-64 illustrates the effect of this approach on bycatch of overfished groundfish.

Since the whiting fishery is managed with a performance standard management tool (bycatch limits), the actual performance of the whiting fishery with respect to bycatch could differ quite substantially from the table above. Indeed, depending on fleet behavior, bycatch could be substantially greater or substantially lower than the numbers indicated above. One reasonable approach at assessing bycatch of overfished species in a performance standard-based fishery is to assess the risk of encountering relatively large amounts of overfished species on a depth basis. The concept behind this approach is that industry is attempting to avoid overfished stocks in order to access whiting. Successful avoidance will mean the fishery can continue operating. However, there is some uncertainty associated with fishing and relatively large and unexpected overfished species catch events can occur. The risk of encountering a relatively large and unexpected catch event can be assessed in a simple fashion by examining the variability of overfished species catch and the size of certain catch events by depth.

A simple, somewhat qualitative, assessment of risk was done to inform the risks associated with various depth contours and the associated implementation of a whiting fishery RCA. This simple assessment was done by plotting the catch of overfished groundfish by whiting sector by depth (Figures 4-23 to 4-28). These figures indicate that substantially more risk of widow rockfish and canary rockfish encounters may exist when participants are operating at depths less than 150 fm than when they are operating at depths greater than 150 fm. The greatest amount of risk may exist when operating between 50 and 125 fm. This information suggests that the implementation of a 150 fm RCA in the whiting fishery may minimize the risk that relatively large encounters of canary and widow rockfish will occur. The minimization of this risk may mean the fishery is better able to prosecute whiting while avoiding overfished stocks.

Table 4-64. Predicted bycatch by non-tribal sectors of the whiting trawl fishery under alternative depth-based RCA restrictions.

Fm Restriction	Sector	Allocation	Canary	Darkblotched	POP	Widow	Yelloweye
No Fm Restriction	Tribal	32,500	0.98	0.00	0.51	2.50	0.00
	Mothership	51,720	1.98	5.83	1.05	113.78	0.01
	CP	73,270	0.24	5.73	1.08	139.21	0.01
	Shoreside	90,510	1.51	2.72	0.32	144.82	0.02
	Total	248,000	4.71	14.28	2.96	400.31	0.04
100 Fm Restriction	Tribal	32,500	0.98	0.00	0.51	2.50	0.00
	Mothership	51,720	2.06	6.24	1.10	117.18	0.00
	CP	73,270	0.24	5.44	1.08	136.48	0.01
	Shoreside	90,510	2.64	8.30	0.67	121.43	0.01
	Total	248,000	5.91	19.98	3.36	377.59	0.02
125 Fm Restriction	Tribal	32,500	0.98	0.00	0.51	2.50	0.00
	Mothership	51,720	2.66	5.12	1.28	104.07	0.00
	CP	73,270	0.18	4.90	0.66	139.64	0.01
	Shoreside	90,510	3.08	11.36	0.41	120.59	0.01
	Total	248,000	6.90	21.38	2.86	366.80	0.02
150 Fm Restriction	Tribal	32,500	0.98	0.00	0.51	2.50	0.00
	Mothership	51,720	0.27	5.27	1.60	93.94	0.00
	CP	73,270	0.13	3.98	0.48	196.90	0.01
	Shoreside	90,510	0.56	12.44	0.48	118.65	0.01
	Total	248,000	1.94	21.69	3.06	411.99	0.02

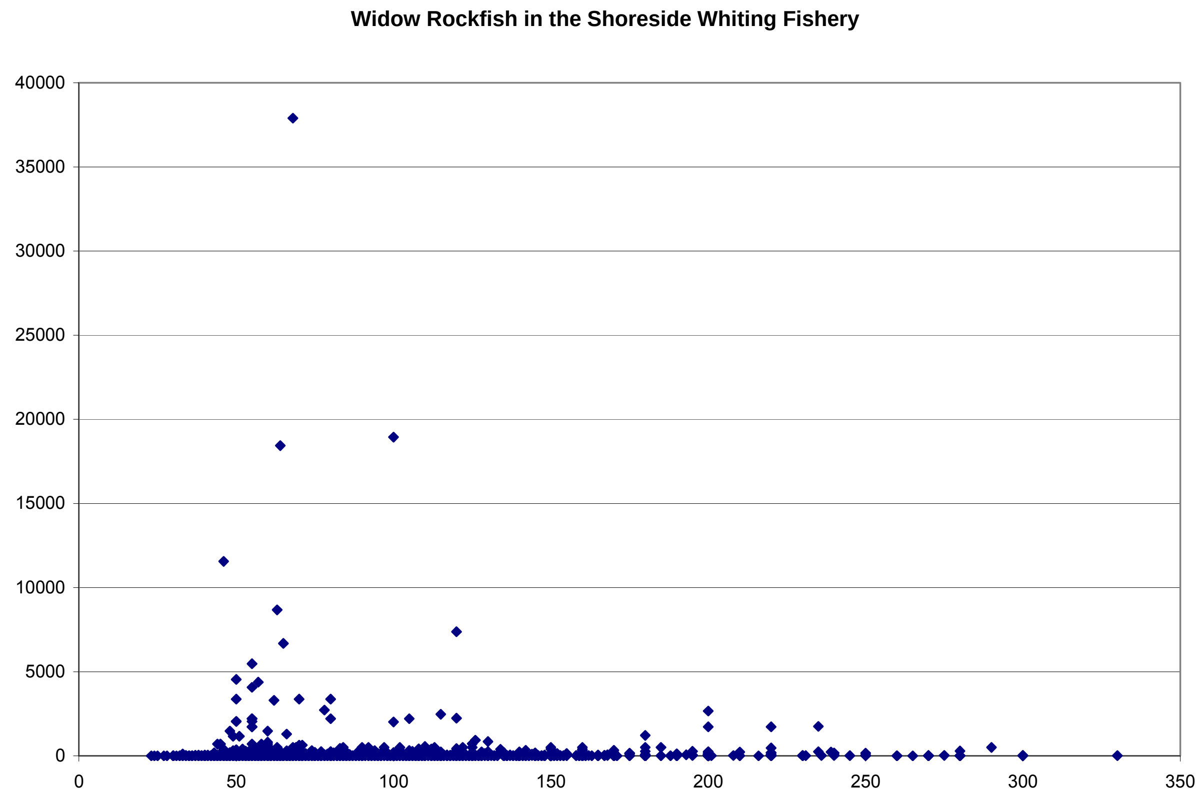


Figure 4-23. Plot of widow rockfish caught in the shoreside whiting fishery by depth (fm).

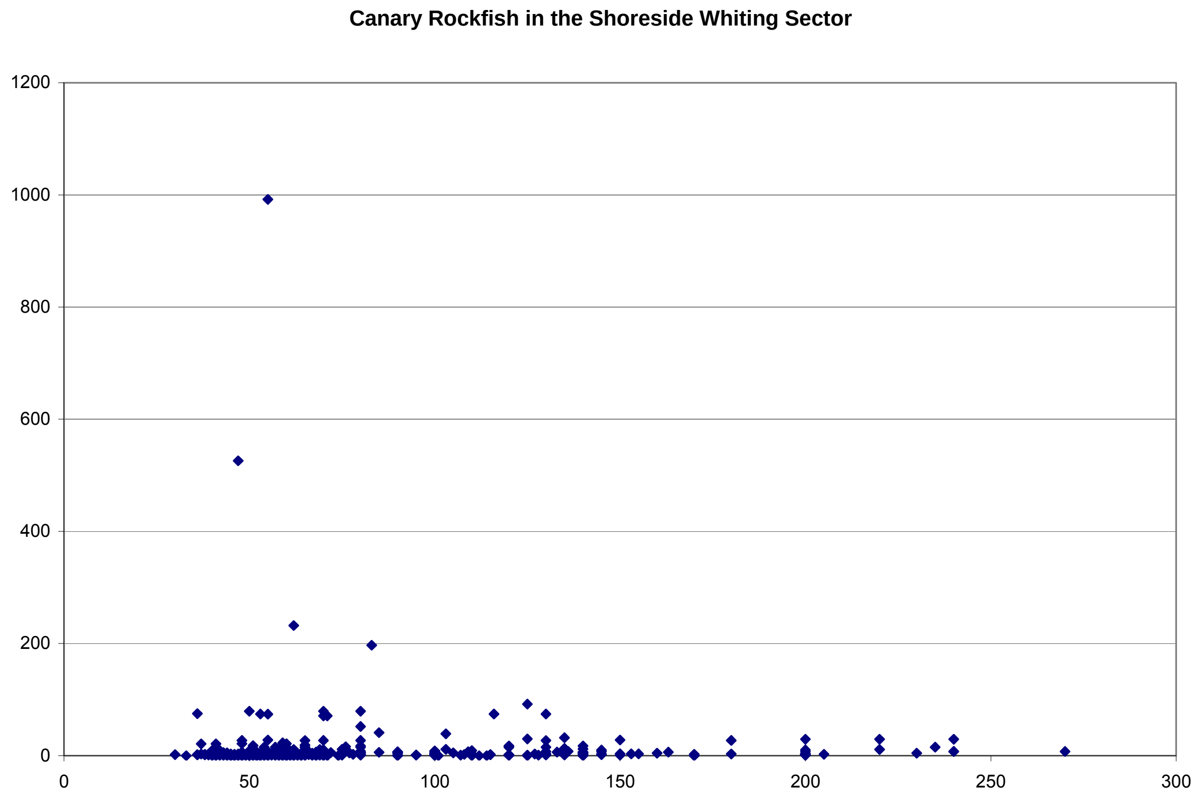


Figure 4-24. Plot of canary rockfish caught in the shoreside whiting fishery by depth (fm).

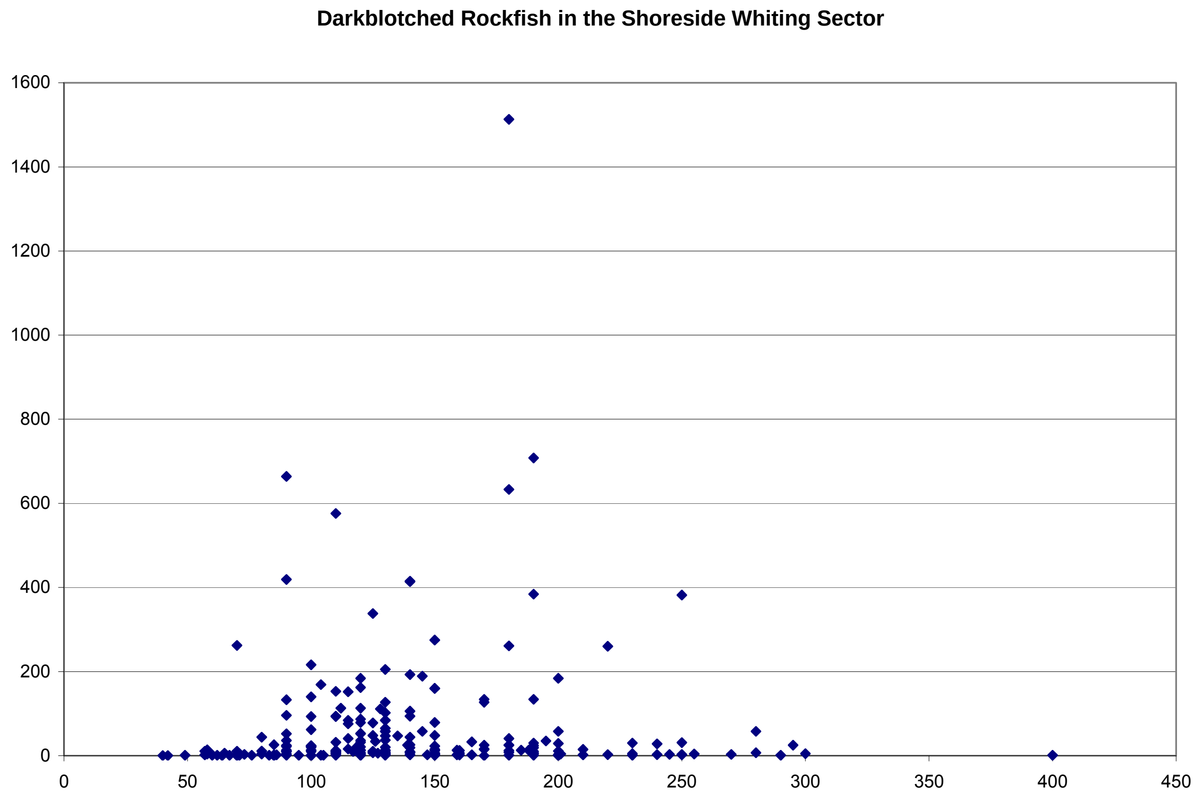


Figure 4-25. Plot of darkblotched rockfish caught in the shoreside whiting fishery by depth (fm).

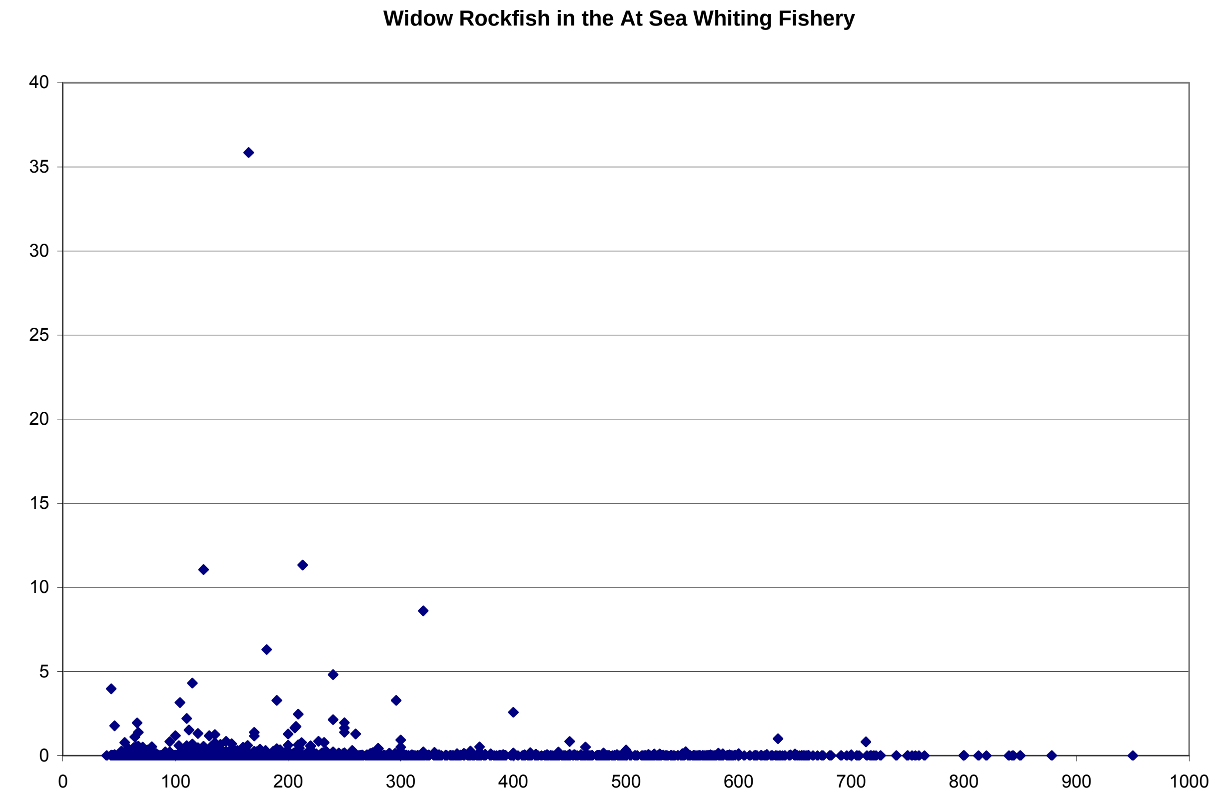


Figure 4-26. Plot of widow rockfish caught in the at-sea whiting fishery by depth (fm).

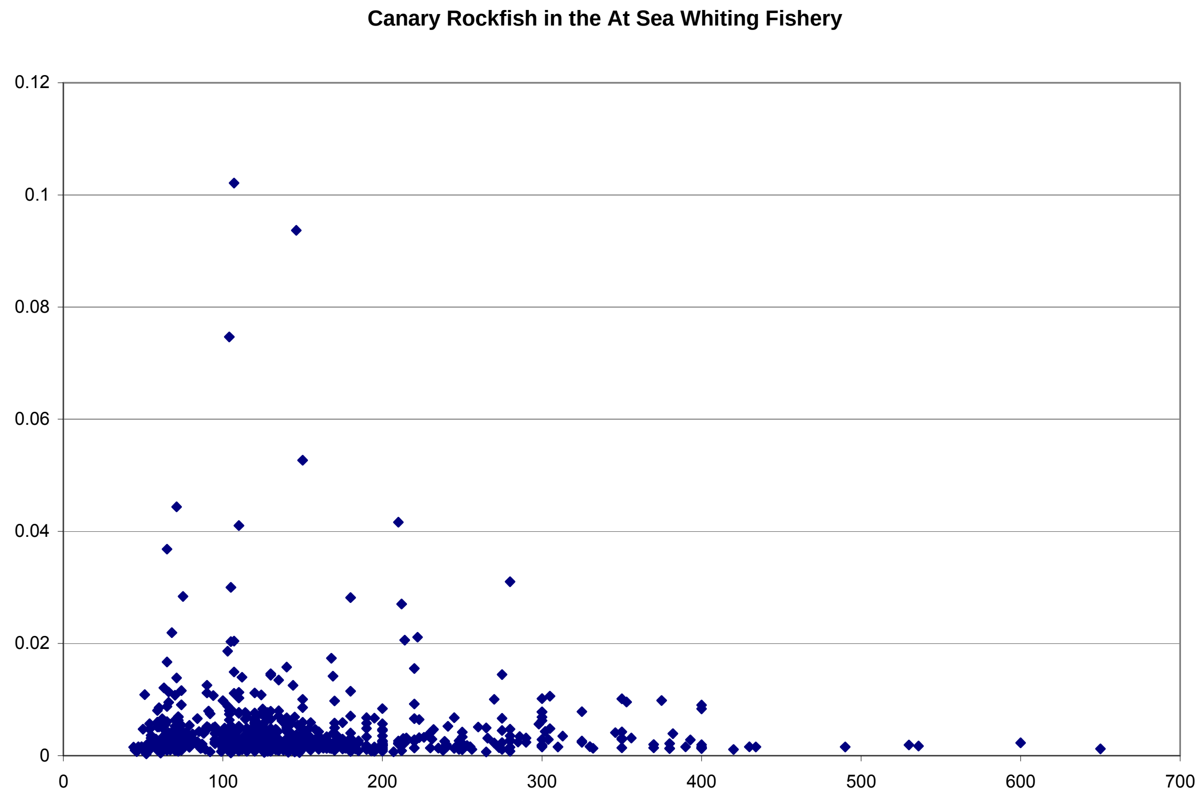


Figure 4-27. Plot of canary rockfish caught in the at-sea whiting fishery by depth (fm).

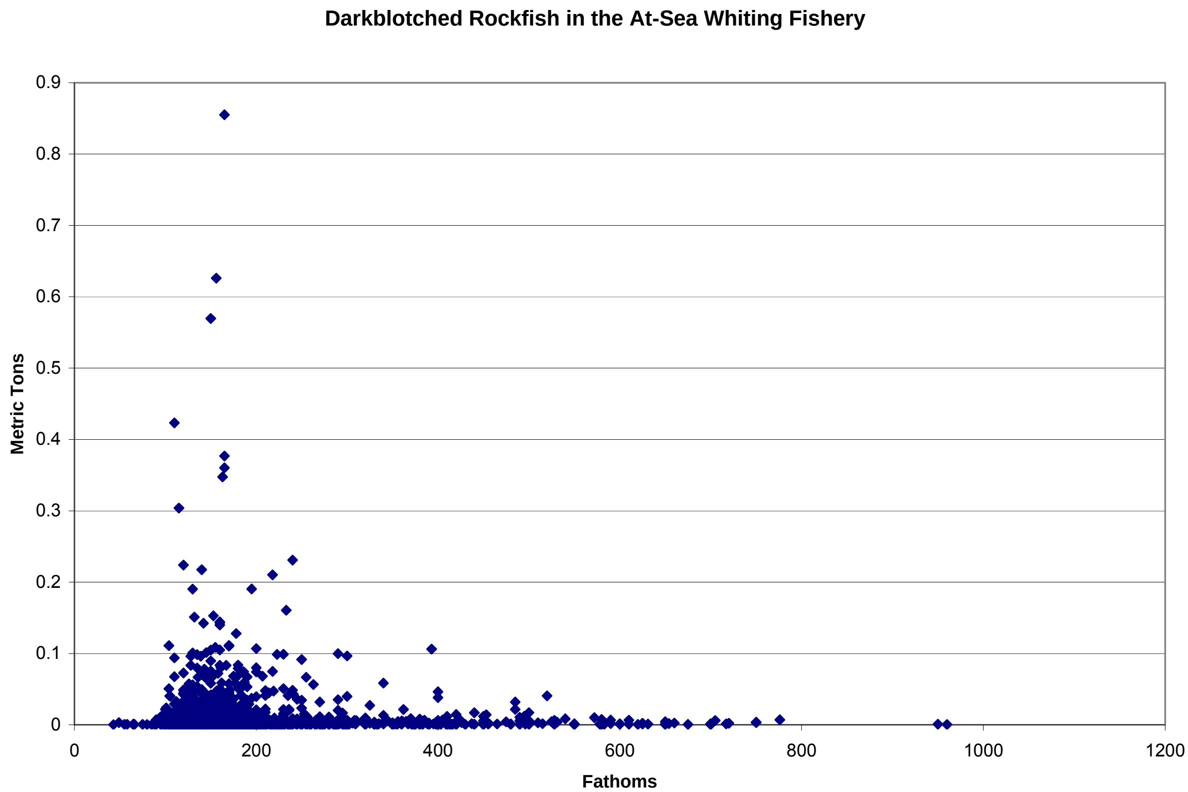


Figure 4-28. Plot of darkblotched rockfish caught in the at-sea whiting fishery by depth (fm).

Sector-specific Bycatch Caps

The Council recommended two options for analysis to determine sector-specific bycatch caps: 1) pro-rata distribution based on whiting allocations and 2) distributions based on whiting bycatch model rates. Additionally, the Council specified two provisions that provide for an unused bycatch limit to either be rolled over to other non-tribal whiting sectors on a pro-rata basis (based on initial whiting allocations), or for use as residual yields by any other sector as needed.

Pro-Rata Distribution Results

Pro-rata distributions of overfished species currently managed with bycatch limits in the Pacific whiting fishery are found in Tables 4-65 to 4-68. The distributions are based on the 2008 status quo bycatch limits as well as bycatch projections from the whiting bycatch model for the highest and lowest whiting OYs specified by the Council for analysis (Tables 2-1a and 2-1b).

Some caution should be exercised when interpreting the bycatch projections from the model as it is based on an extension of the linear trend analysis for predicting widow bycatch that the Groundfish Management Team has been using since the start of 2007. Data used to inform the model is through 2007, and therefore, the trend is predicting bycatch rates two years into the future. This creates some substantial uncertainty, so the estimates are best treated as order of magnitude estimates. The whiting bycatch model uses both weighted averages (canary and darkblotched) and a linear interpolation (widow) from 2004-2007 fishery data. This approach assumes that fleet depth distributions are similar to 2004-2007. However, in 2008 the Council adopted a new bycatch limit strategy which is intended to result in more catcher-processor and mothership effort occurring in deeper depths, potentially reducing canary and widow rockfish bycatch rates relative to previous years. The expected reduction in widow rockfish impacts as a result of the potential effort shift, are provided in Table 4-68.

Table 4-65. Predicted sector distributions of canary rockfish under status quo bycatch limits, a high whiting OY scenario, and a low whiting OY scenario.

Non-tribal Whiting Sector	Status Quo Distribution (mt)	High Whiting OY Bycatch Projection (mt)	Low Whiting OY Bycatch Projection (mt)
Catcher-Processor	1.60	2.16	0.64
Mothership	1.13	1.52	0.45
Shoreside	1.97	2.67	0.79
Total	4.7	6.35	1.89

Table 4-66. Predicted sector distributions of darkblotched rockfish under status quo bycatch limits, a high whiting OY scenario, and a low whiting OY scenario.

Non-tribal Whiting Sector	Status Quo Distribution (mt)	High Whiting OY Bycatch Projection (mt)	Low Whiting OY Bycatch Projection (mt)
Catcher-Processor	13.60	8.27	2.46
Mothership	9.60	5.84	1.74
Shoreside	16.80	10.22	3.04
Total	40	24.33	7.23

Table 4-67. Predicted sector distributions of widow rockfish under status quo bycatch limits, a high whiting OY scenario, and a low whiting OY scenario.

Non-tribal Whiting Sector	Status Quo Distribution (mt)	High Whiting OY Bycatch Projection (mt)	Low Whiting OY Bycatch Projection (mt)
Catcher-Processor	93.50	230.54	68.53
Mothership	66.00	162.74	48.37
Shoreside	115.50	284.79	84.66
Total	275	678.07	201.56

Table 4-68. Predicted sector distributions of widow rockfish under status quo bycatch limits, a high whiting OY scenario, and a low whiting OY scenario. the bycatch projections for the high and low whiting OY scenarios are adjusted for the new darkblotched rockfish strategy.

Non-tribal Whiting Sector	Status Quo Distribution (mt)	High Whiting OY Bycatch Projection (mt)	Low Whiting OY Bycatch Projection (mt)
Catcher-Processor	13.60	192.12	57.11
Mothership	9.60	135.61	40.31
Shoreside	16.80	237.33	70.55
Total	40	565.06	167.97

Sector-Specific Bycatch Limits

Sector-specific bycatch limits were also calculated based on the whiting bycatch model projections (Tables 4-69 to 4-71). Distributions are based on the 2008 whiting OY as well as the highest and lowest whiting OYs specified by the Council for analysis (Tables 2-1a and 2-1b). As mentioned previously, some caution should be exercised when interpreting the bycatch projections from the model as it is based on an extension of the linear trend analysis for predicting widow bycatch two years into the future. This creates some substantial uncertainty, so the estimates are best treated as order of magnitude estimates. Also, this approach assumes that fleet depth distributions are similar to 2004-2007 and does not account for the potentially deeper depth distributions of the at-sea fleet which may occur in 2008. The expected reduction in widow rockfish impacts, as a result of the potential effort shift, are estimated in the final column of each table.

Table 4-69. Bycatch model predictions of canary, darkblotched, and widow rockfish by sector under a high whiting OY scenario.

Non-tribal Whiting Sector	Canary (mt)	Darkblotched (mt)	Widow (mt)	Widow - New Strategy (mt)
Catcher-Processor	0.41	9.76	237.29	
Mothership	3.37	9.94	193.94	
Shoreside	2.57	4.63	246.84	
Total	6.35	24.33	678.07	565.06

Table 4-70. Bycatch model predictions of canary, darkblotched, and widow rockfish by sector under the status quo whiting OY.

Non-tribal Whiting Sector	Canary (mt)	Darkblotched (mt)	Widow (mt)	Widow - New Strategy (mt)
Catcher-Processor	0.26	6.18	150.22	
Mothership	2.13	6.29	122.78	
Shoreside	1.63	2.93	156.27	
Total	4.02	15.40	429.28	357.73

Table 4-71. Bycatch model predictions of canary, darkblotched, and widow rockfish by sector under a low whiting OY scenario.

Non-tribal Whiting Sector	Canary (mt)	Darkblotched (mt)	Widow (mt)	Widow - New Strategy (mt)
Catcher-Processor	0.12	2.90	70.54	
Mothership	1.00	2.95	57.65	
Shoreside	0.76	1.38	73.37	
Total	1.89	7.23	201.56	167.97

The sector allocation of whiting differs significantly from historical utilization of bycatch by sector (Table 4-72). For example, historically the catcher-processor sector utilized 7.91 percent of the total canary rockfish take while successfully achieving the sector's whiting allocation. Under a pro-rata distribution, the catcher-processor fleet would receive 34 percent, an allocation that may be unnecessarily high. Additionally, data indicates that the darkblotched rockfish limit has been restricting fishing flexibility for both the catcher-processor and mothership fleets. Historically, the catcher-processor and mothership fleets utilized 42 percent and 37.57 percent, respectively, of the total darkblotched rockfish take (Table 4-69). Shoreside, however, only used 20.42 percent. The pro-rata distribution based on the whiting allocation would result in 42 percent of the darkblotched rockfish limit being distributed to the shoreside fleet, which may be unnecessarily high and may further constrain the at-sea sectors. Therefore, adjustments to the pro-rata distributions, taking into consideration historical utilization, may be necessary to prevent setting an overly constraining or unreasonably high limit.

Table 4-72. Historical utilization (2005-07) of overfished species impacts, compared to the whiting sector allocation.

Non-tribal Whiting Sector	Canary Rockfish	Darkblotched Rockfish	Widow Rockfish	Whiting Allocation
Catcher-Processor	7.91%	42.00%	31.96%	34%
Mothership	32.36%	37.57%	31.55%	24%
Shoreside	59.73%	20.42%	36.49%	42%

The disparity between historical utilization of bycatch limit species and the pro-rata allocations are likely a result of fleet depth and latitude distributions. Generally, shoreside vessel activities are restricted by the distance from shore, and thus the fleet's depth distribution is also limited. This restriction occurs because shoreside vessels must remain in close proximity to the shoreside processing plants in order to maintain product quality. Also, some smaller shoreside vessels do not have the equipment necessary to fish at deeper depths (e.g., horsepower). Catcher vessels participating in the mothership fishery and catcher-processors have greater flexibility in terms of fishing location and depth since they are not tied to a port area. Since the three bycatch limit species have different depth distributions, it is anticipated that each sector will have different bycatch needs based on the sector's depth distribution. Generally, canary and widow rockfish are found along the continental shelf while darkblotched rockfish are found along the slope. As such, an upward adjustment in the canary and widow rockfish limit may be appropriate for the shoreside sectors while an upward adjustment in the darkblotched rockfish limit may be appropriate for the at-sea sectors.

Sector-specific bycatch limits generated from the whiting bycatch model reflect historical the depth distributions of the fleet. Therefore, the allocations more closely aligned with historical utilization may result in less disruption to status quo operations.

Implementing sector-specific bycatch limits, either through pro-rata distributions or by using the bycatch model, may be appropriate for species with relatively larger limits and may be overly constraining for species with relatively lower limits. For example, the status quo canary rockfish bycatch limit is 4.7 mt. Under a pro-rata distribution, the catcher-processor sector would receive 1.60 mt, mothership sector would receive 1.13 mt, and shoreside would receive 1.97 mt (Table 4-65). Dividing this relatively small limit by three sectors may limit fleet flexibility in some cases, but may reduce the probability that one sector may affect another in other cases. For a species like widow rockfish where the total limit is greater, division among sectors may not reduce flexibility to the same degree as a divided canary rockfish limit.

Sector-specific bycatch limits provides the surety that some amount of bycatch will be available regardless of the season or other sector's operations. This could reduce cross-sector competition and the race for bycatch that currently exists in the whiting fishery. Specifically, sector-specific limits could provide the opportunity for a sector to change the primary season in which they operate, which could provide the opportunity to enhance their participation in other fisheries, maximize profit, and potentially reduce bycatch. For example, the catcher-processor sector has stated a preference for a fall fishery given a sector-specific bycatch limit. Data indicate that there is less bycatch and improved whiting product recovery in the fall {Larkin and Sylvia, 1999}. Thus a fall fishery might be preferable for this sector. However, a fall fishery may not be desirable for the mothership or shoreside sectors. Under sector-specific bycatch limits, these sectors would still have the opportunity to choose the season which provides them the greatest operational flexibility.

The Council specified two provisions that provide for unused bycatch limits to be either rolled over to other non-tribal whiting sectors on a pro-rata basis (based on initial whiting allocations) or placed back into the scorecard for use by all sectors. If rollovers are done on a pro-rata basis, the distributions may not match up with the sector's historical depth distribution. Therefore, it may be more appropriate to re-distribute the rollover based on projected needs from the bycatch model. For efficiency, these rollovers could be done automatically outside of a Council meeting to prevent a stop and start fishery. Further, once the whiting allocation for all sectors has been reached, it would be logical to roll any excess back into the scorecard for use by the non-whiting sectors.

The second option for unused bycatch limits is to rollover the excess into the scorecard for use by non-whiting sectors, prior to the whiting allocation for all sectors being reached. If this option is selected, there is a possibility that the excess could be used by a non-whiting sector and none would be remaining if a whiting sector required more. This could result in a situation where the whiting allocation for that sector remains unharvested.

Rollovers that are scheduled only when a sector achieves its whiting allocation may restrict fleet flexibility. For example, consider a scenario where two sectors are fishing concurrently and sector A runs out of bycatch prior to achieving its whiting allocation. Sector B may be willing to release some bycatch to sector A, depending on the amount needed, prior to attaining its sector allocation. However, if the rollover provisions state that a sector's whiting allocation must be harvested prior to the rollover, this option would not be available. In order to provide for greater flexibility, an option similar to the current whiting reapportionment rule could be considered. Under the whiting reapportionment, on a certain date (September 15) NMFS consults with industry to determine whether the sector intends to harvest their remaining whiting allocation. If the Regional Administrator determines that the whiting allocation will not be used by the end of the fishing year, it may be made available for harvest by all sectors. Depending on the amount of bycatch needed, it may be feasible to consider a rollover prior to the sector achieving its allocation. An examination of the current season bycatch rates would provide an indication of how much bycatch a sector could rollover without jeopardizing the opportunity to harvest their remaining whiting allocation. A rollover could be considered on a certain date or at a Council meeting, instead of restricting the rollover period to the time after a sector harvests its whiting allocation.

Seasonal Releases of Bycatch Limits

At its April 2008 meeting, the Council recommended an analysis of seasonal releases of bycatch limits in the non-tribal Pacific whiting fishery (Table 4-73). Seasonal releases are one means of protecting individual sectors from one another. In particular, a seasonal release can protect the shoreside sector (which starts June 15) from the at-sea sectors (which start on May 15). Since the three fisheries share a common bycatch limit, the activities of one sector can affect others making it possible that the at-sea sectors can preempt the shoreside sector, which is similar to status quo conditions.

Table 4-73. Council-recommended seasonal releases of bycatch limit species.

	April 15	June 15	Fall a/
Option 1	45%	40%	15%
Option 2	50%	40%	10%
Option 3	50%	45%	5%
a/ September 1, September 15, or October 1.			

The whiting bycatch model was used to estimate bycatch needs based on the status quo whiting OY as well as the highest and lowest whiting OYs adopted by the Council for analysis. Then, the Council recommended proportions were applied to the bycatch projections in order to reflect the amounts available under each of the seasonal distributions (Tables 4-74 to 4-76).

Table 4-74. Predicted scheduled release of widow rockfish assuming a status quo bycatch limit and high/low whiting OYs.

Status Quo Widow Bycatch Limit (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	123.75	110.00	41.25
Option 2	137.50	110.00	27.50
Option 3	137.50	123.75	13.75
Widow Bycatch Limit 275 mt			
Projection Under the High Whiting OY (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	305.13	271.23	101.71
Option 2	339.04	271.23	67.81
Option 3	339.04	305.13	33.90
Widow Bycatch Limit 678.08 mt			
Projection Under the Low Whiting OY (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	90.70	80.62	30.23
Option 2	100.78	80.62	20.16
Option 3	100.78	90.70	10.08
Widow Bycatch Limit 201.56 mt			
Projection Under the High Whiting OY, Incorporates New Darkblotched Strategy (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	254.28	226.02	84.76
Option 2	282.53	226.02	56.51
Option 3	282.53	254.28	28.25
Widow Bycatch Limit 565.06 mt			
Projection Under the Low Whiting OY, Incorporates New Darkblotched Strategy (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	75.59	67.19	25.20
Option 2	83.99	67.19	16.80
Option 3	83.99	75.59	8.40
Widow Bycatch Limit 167.97 mt			
a/ September 1, September 15, or October 1.			

Table 4-75. Predicted scheduled release of canary rockfish assuming a status quo bycatch limit and high/low whiting OYs.

Status Quo Canary Bycatch Limit (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	2.12	1.88	0.71
Option 2	2.35	1.88	0.47
Option 3	2.35	2.12	0.24
Canary Bycatch Limit 4.7 mt			
Projection Under the High Whiting OY (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	2.86	2.54	0.95
Option 2	3.18	2.54	0.64
Option 3	3.18	2.86	0.32
Canary Bycatch Limit 6.35 mt			
Projection Under the Low Whiting OY (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	0.85	0.76	0.28
Option 2	0.95	0.76	0.19
Option 3	0.95	0.85	0.09
Canary Bycatch Limit 1.89 mt			
a/ September 1, September 15, or October 1.			

Table 4-76. Predicted scheduled release of darkblotched rockfish assuming a status quo bycatch limit and high/low whiting OYs.

Status Quo Limit (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	18.00	16.00	6.00
Option 2	20.00	16.00	4.00
Option 3	20.00	18.00	2.00
Darkblotched Bycatch Limit 40 mt			
Projection Under the High Whiting OY (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	10.95	9.73	3.65
Option 2	12.17	9.73	2.43
Option 3	12.17	10.95	1.22
Darkblotched Bycatch Limit 24.33 mt			
Projection Under the Low Whiting OY (mt)			
	15-Apr	15-Jun	Fall a/
Option 1	3.25	2.89	1.08
Option 2	3.62	2.89	0.72
Option 3	3.62	3.25	0.36
Darkblotched Bycatch Limit 7.23 mt			
a/ September 1, September 15, or October 1.			

Additionally, whiting bycatch data was initially analyzed with Generalized Additive Models, where the independent variables included sector, year, month, week into season, and the interactions of these main effects. Smoothing of these variables was used, where possible. Most of the interactions were significant; however, trends were difficult to interpret with this small, unbalanced dataset. Therefore, separate sector models with only month as a categorical variable was used to look at the monthly trend, over all years, and by sector (Figures 4-29 to 4-31). The plots reveal that bycatch of darkblotched, POP, and widow in the catcher-processor sector decreases as the season progresses. The trend for canary is less certain but there is a slight decline. Mothership participation in the whiting fishery is greatest in May and June, but less in summer and fall. As a result, confidence intervals are wide and trends are less certain. However, for darkblotched, widow, and canary rockfish some decrease in bycatch is evident. For the shoreside fishery, seasonal bycatch trends are less evident, though an increase in POP bycatch is seen later in the year. Specifically, the lack of data later than August precludes meaningful insight for seasonal trends in this sector.

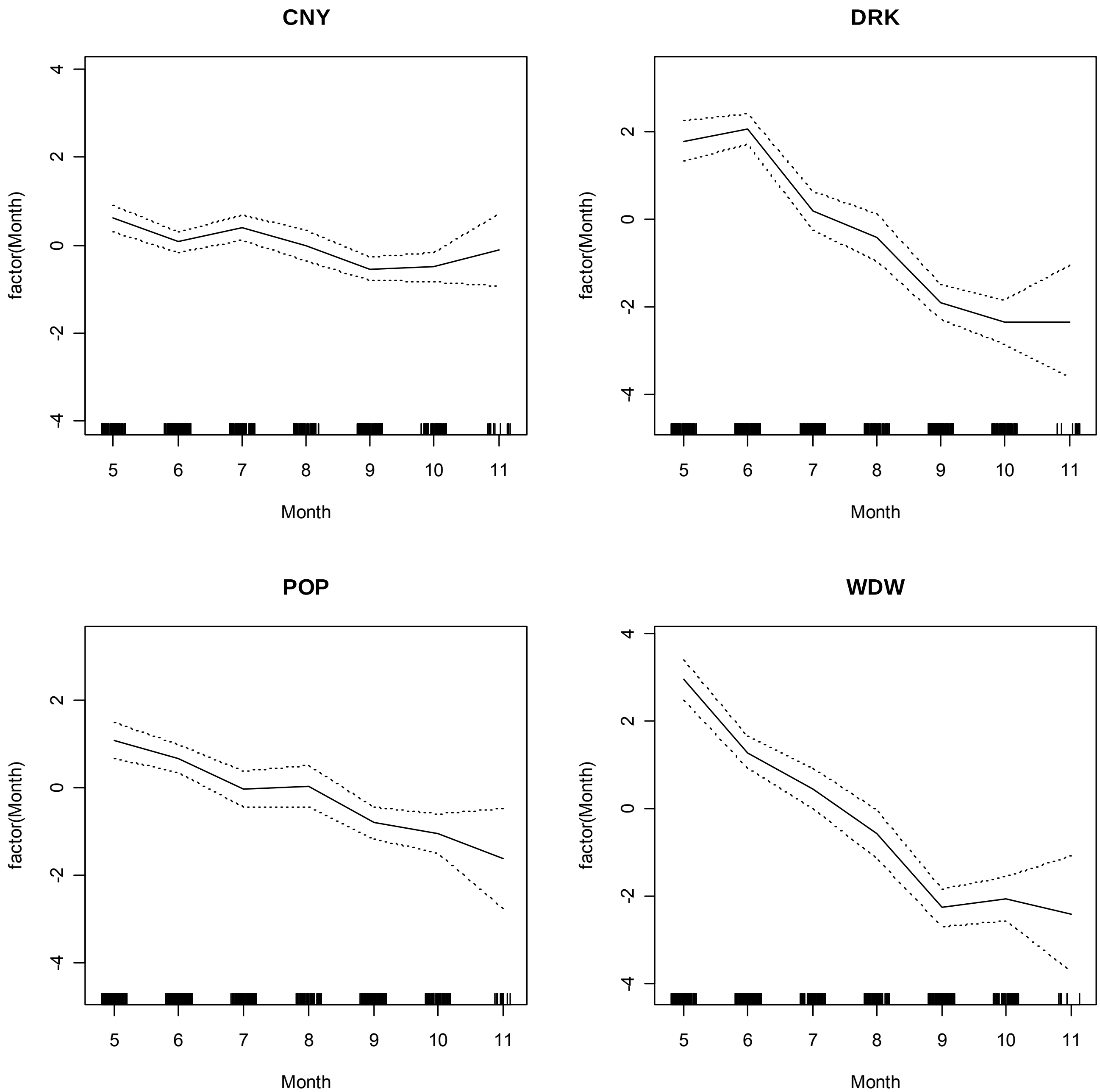


Figure 4-29. 2004-2007 catcher-processor data bycatch data (does not include data from the 2007 re-opening). Dependent variable is log of daily aggregated bycatch weight divided by daily aggregated Pacific whiting catch. The independent variable is month as a category. Y-axes contain relative coefficients. Note that the ranges on the y-axes are equal.

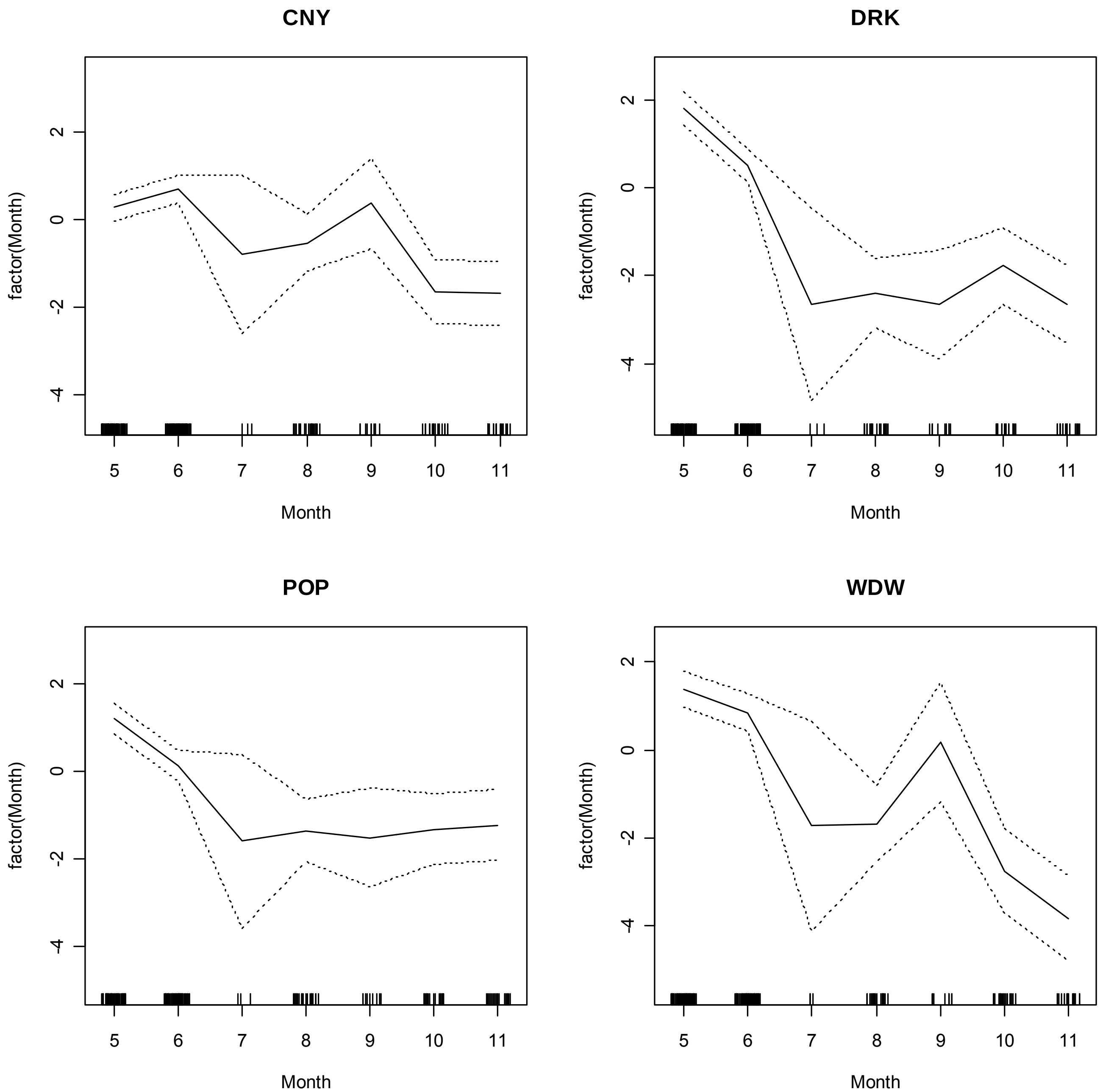


Figure 4-30. Mothership bycatch data modeled (does not include data from the 2007 re-opening). Dependent variable is log of daily aggregated bycatch weight divided by daily aggregated Pacific whiting catch. The independent variable is month as a category. Y-axes contain relative coefficients. Note that the ranges on the y-axes are equal.

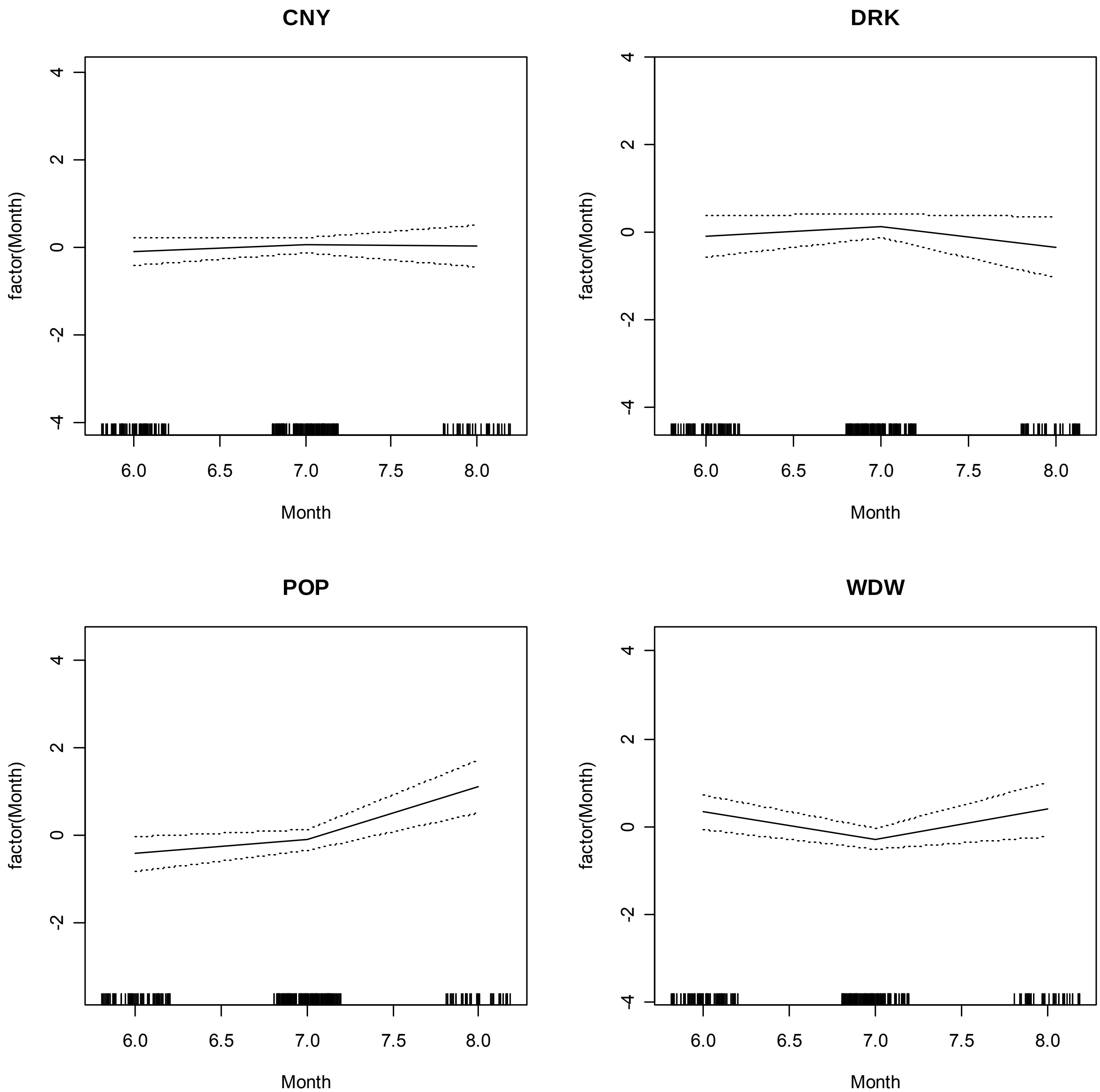


Figure 4-31. Shoreside data bycatch data modeled (does not include data from the 2007 re-opening). Dependent variable is log of daily aggregated bycatch weight divided by daily aggregated Pacific whiting catch. The independent variable is month as a category. Y-axes contain relative coefficients. Note that the ranges on the y-axes are equal.

Seasonal releases of bycatch can be viewed as a bycatch management tool used in lieu of sector-specific allocations of bycatch. Seasonal releases are one method of protecting one sector from another (since the sectors traditionally operate at different times) and minimizing the risk of bycatch occurring in one sector affecting the opportunities in another sector. If the amount of bycatch allocated to each season is structured in an appropriate fashion, such seasonal releases may allow successful prosecution of whiting activity while insuring that the sector that starts later in the year is not pre-empted by the attainment of a bycatch limit from sectors operating earlier in the year.

Figure 4-29 reveals that bycatch of darkblotched, POP, and widow in the catcher-processor sector decreases as the season progresses. Therefore, bycatch in this sector may be reduced if seasonal releases are structured to leave sufficient amounts available for a fall fishery. Although no bycatch limits are currently specified for the whiting fishery, the seasonality of POP interactions in the catcher-processor sector should also be taken into consideration.

Historical participation in the mothership sector is greatest in May and June with less fall fishing. As a result, confidence intervals are wide and seasonal bycatch trends are less certain. However, for darkblotched, widow, and canary rockfish, some decrease in bycatch is evident. The timing of mothership participation in the whiting fishery is coordinated with both the mothership and catcher vessel participation in the Alaska pollock fishery. If seasonal releases of bycatch are used to alter the seasonal structure of the mothership whiting fishery, complicated logistics could arise. For example, some whiting catcher vessels participate in the shorebased pollock sector and some in the at-sea pollock sector. Catcher vessels are then restricted to periods where the shoreside plants or motherships are accepting pollock deliveries. Further, approximately half of the whiting mothership catcher vessels also fish in the shoreside whiting fishery. Therefore, it is uncertain how much whiting fall fishing would occur in the mothership sector if seasonal distributions provided for a larger fall fishery.

For the shoreside fishery, seasonal bycatch trends are less evident due to a lack of a historical fall fishery. Thus, it is uncertain how much fall fishing would occur and what the associated bycatch interactions would be if seasonal distributions provided for a larger fall fishery. Approximately half of the shoreside vessels also participate as catcher vessels in the whiting mothership fishery. Therefore, the timing of the shoreside fishery is somewhat related to the timing of the mothership fishery. Additionally, some shoreside catcher vessels also participate in the Alaska pollock fishery, so their participation in the whiting fishery is also coordinated with the pollock seasons. Finally, processing companies may be affected by changing the seasonal distribution of the shoreside fishery. For example, processing facilities need to coordinate the volume of whiting deliveries relative to other processing activities (e.g., sardines, groundfish, etc).

One restriction created by a seasonal release of bycatch is that it may make it difficult for harvesters in a sector to change the timing of their fishing opportunity. If, for example, 50 percent of the widow is allocated to the time period between April and June, that 50 percent allocation of widow may work effectively at preserving fishing opportunity based on past practice. If one sector desires to spend more time fishing in the fall months however, that amount of widow allocated to the April through June time period may be inappropriate and may make it difficult for harvesters to fish later in the year (because there would presumably be less widow later in the year than would otherwise be the case). Compare this situation to a case where each sector has their own bycatch limit and harvesters can choose the harvest timing they find most appropriate and use the allocated bycatch during that time. Under this latter situation, changing harvest timing may be relatively simpler compared to a case where seasonal releases of bycatch are made.

Changing the At-Sea Processing Restrictions in the Shoreside Whiting Fishery

In 2006 and 2007, a 68 foot shore-based vessel headed and gutted Pacific whiting at sea (NOAA, April 2008). The vessel used a smaller net and shorter tows to maintain product quality. Head and gut machines were used at sea and the product was immediately placed in thick slurry of ice. As a result, the vessel was able to significantly increase its at-sea production and ex-vessel price of Pacific whiting. The ex-vessel price of the headed and gutted catch was approximately four times greater than the price for whiting landed whole in unsorted EFP landings, and approximately double the price when taking the weight conversion from dressed head off form to round weight into account (i.e., when comparing prices on the basis of a common weight measure). Because fish that are headed and gutted (i.e., leaving the tail on) with no further processing (such as freezing) are not considered to be a final product, under current regulations, the vessel's activities do not qualify as a catcher-processor. The operation, which occurred during the primary season for the shore-based sector, was allowed to operate within the Rockfish Conservation Areas without an EFP and an electronic monitoring system (EMS).

At its April 2008 meeting, the Council requested an analysis of an at-sea processing exemption for Pacific whiting vessels 75 feet and less for 2009-10. The intent of the proposal is to explore the expansion of this value-added operation and to allow for further processing (i.e., tailing and freezing) by small vessels. The Council stipulated that vessels qualifying for the small vessel processing exemption would fish under the shoreside whiting allocation and be exempt from current catcher-processor monitoring requirements.

The proposed rule for Amendment 10 contains provisions for a maximized retention and monitoring program for the shoreside Pacific whiting fishery (NOAA, May 2007). Maximized retention encourages full retention while recognizing that minor discard events that include large animals (> 6 ft) and minor levels of operational discard may occur. The Amendment 10 proposed rule also allows qualifying vessels to obtain a waiver which would allow for sorting at-sea, an activity necessary to conduct the proposed small vessel processing activities. Under the Amendment 10 waiver, vessels are required to carry and pay for an observer so discards can be monitored. Preliminary analyses indicate that, based on the qualifying criteria, only one vessel qualifies for the sorting waiver. If a small vessel processing exemption is desired, then a modification of the Amendment 10 sorting waiver may be necessary in order to allow additional vessels to sort at sea. Furthermore, modifications to shoreside monitoring or reporting requirements may be necessary in order to track Pacific whiting landings relative to the shoreside allocation.

The proposed rule for Amendment 15 would create a limited entry program for the non-tribal sectors of the Pacific whiting fishery. Amendment 15 is intended to be an interim measure until the implementation of a trawl individual quota or cooperative management program under Amendment 20; however, no sunset provision has been established. The total number of eligible vessels that qualify in each Pacific whiting sector (i.e., shoreside, catcher-processor, and mothership) will be limited under Amendment 15 and thus the total number of vessels eligible for the small vessel processing exemption would also be limited. However, limitations on entry could expire upon Amendment 20 implementation, as early as 2011, and the total number of vessels eligible for the small vessel processing exemption would be unlimited.

Of the vessels that qualify under the Amendment 15 criteria with a current limited entry permit, 12 vessels are 75 feet and less and thus would be eligible for the proposed small vessel processing exemption. Thirty seven vessels would be excluded. Seventeen additional vessels qualify under Amendment 15, but do not currently hold a limited entry permit. The lengths of these vessels are unknown. The number of vessels that would be eligible if/when Amendment 15 sunsets would be unlimited. Additionally, depending on the management measures adopted for the catcher-processor sector (IFQ or co-ops) under Amendment 20, participation in the catcher-processor sector could also be unlimited if/when Amendment 15 sunsets. Under the current regulatory structure, there are no limitations on length for the catcher-processor sector.

Thus far, one vessel has expressed interest in the small vessel processing exemption. Preliminary discussions with the Groundfish Advisory Subpanel did not indicate concern if the Pacific whiting removals under the small vessel processing exemption were deducted from the shoreside sector whiting allocation. However, if small boat processing became significantly more efficient than traditional shoreside catcher vessel operations and greatly expanded, inequity concerns could arise. As previously mentioned, 12 vessels are eligible vessels under the proposed processing exemption under Amendment 15. Information on the capacity and potential processing capabilities of the 12 vessels is unavailable, thus potential Pacific whiting removals are unknown. If Amendment 20 is adopted and Amendment 15 sunsets, participation would be unlimited and removals could greatly increase. The Council may wish to consider a limit to the amount of Pacific whiting that can be processed under the small vessel processing exemption.

In April 2008, the Council specified that small vessels under the proposed exemption would not be subject to the same catch monitoring requirements as catcher-processors. It may be impractical and overly burdensome, given space constraints and the type of operations, to require the catcher-processor monitoring requirements on vessels 75 feet or less. However, some at-sea monitoring specific to the proposed operations is appropriate given the need to adequately track the incidental take of Chinook salmon, as required in the Endangered Species Act (ESA) Section 7 Biological Opinion for Chinook salmon catch in the Pacific Whiting Fishery, to meet the standardized reporting methodology defined by the Magnuson-Stevens Act and to track the catch of target and overfished groundfish species such that the fishing industry is not unnecessarily constrained and that OYs, harvest guidelines, sector allocations and bycatch limits are not exceeded (NOAA, May 2007). The following considerations were identified with regard to catch monitoring requirements for small vessels processing at-sea: 1) sample design, 2) levels of observer coverage, 3) logistics and cost structure of observer coverage, and 4) inseason monitoring and data storage.

A sampling program for vessels sorting at sea would likely focus on discards, especially Chinook salmon and bycatch limit species, since the Pacific whiting would be landed and tracked shoreside. Prior to 1994, at-sea observers were used in the shoreside whiting fishery and information from those operations may be useful in developing a new program. Sample design for these vessels may also be similar to the discard sampling that occurs in the non-whiting groundfish fisheries. Additionally, at-sea sampling occurs in the catcher-processor and mothership sectors of the whiting fishery. Factory sampling on these large vessels will likely be very different from small vessel operations, however some similarities may exist.

Currently, the WCGOP observes approximately 25 percent of the non-whiting trawl fleet. Less than 100 percent catch monitoring on small vessels processing whiting may not be sufficient to meet the objectives outlined above (monitoring of Chinook salmon, bycatch limits, etc.). Therefore, consideration should be given to developing a program with independent funding in order to adequately sample the operations.

If a monitoring program for small processing vessels is desired, the cost structure and training model from the catcher-processor sector could be adopted. Currently, catcher-processors and motherships hire and pay for groundfish observers through a NMFS approved contractor. Training for these observers is coordinated with NMFS personnel and also paid for by industry.

At-sea data on discards collected from these small processing vessels would need to be incorporated into a database and monitored inseason. Currently, at-sea data are stored at the Alaska Fisheries Science Center in the NORPAC database and shoreside data are stored at the Northwest Region. Sample data collected from small vessels processing at sea would be similar in nature to data collected in the catcher-processor sector (i.e., discard data); however, tracking of whiting and bycatch would be specific to the shoreside sector. Therefore, some forethought and data coordination would be necessary to accommodate these new data.

4.5.2.3 *Limited Entry Fixed Gear*

The 2009-10 limited entry fixed gear management measure alternatives are designed to progressively avoid yelloweye rockfish impacts by moving all or a portion of the seaward boundary of the non-trawl RCA north of 40°10' N latitude from 100 fm to 125 fm or 150 fm (Table 4-77). The yelloweye rockfish impacts predicted under each alternative are compared against the yield amounts available under alternative catch sharing scenarios using the 2005 or 2007 scorecard amounts (Table 2-8) and alternative yelloweye rockfish OYs in Table 4-78. This comparison reveals that the status quo RCA configuration cannot be sustained under yelloweye OYs less than 15 mt unless more yelloweye impacts are allocated to the limited entry fixed gear sector than provided under the 2005 or 2007 scorecard catch sharing scenarios. However, predicted impacts under all the other management measure scenarios under those two catch sharing scenarios can be accommodated under lower yelloweye OYs. A minimal change to the northern non-trawl RCA configuration under OYs less than 15 mt are provided under LEFG Alternatives 5 and 6, both of which are predicted to result in a 1.2 mt yelloweye impact. These two alternatives move the seaward RCA boundary to 125 fm in the area north of Pt. Chehalis under LEFG Alternative 5 or between 43° N latitude (the Columbia-Eureka line near Cape Blanco, Oregon) and Cascade Head, Oregon under LEFG Alternative 6. These two subareas exhibited the two highest bycatch rates of yelloweye by the observed fixed gear fleets of the four northern subareas analyzed (Tables 4-35 to 4-37).

The amounts of retained sablefish associated with aggregated observed trips in these two subareas at depths deeper than 125 fm (Table 4-29) are approximately 79% and 76% of retained sablefish associated with aggregated observed trips in these two subareas at depths deeper than 100 fm (Table 4-28) for the subarea north of Pt. Chehalis and the subarea between 43° N latitude and Cascade Head, respectively. It is likely that fixed gear fishermen targeting sablefish in these two subareas would still be able to attain their sablefish allocations by moving to depths greater than 125 fm in either area, although overhead costs associated with longer runs to open fishing grounds may increase. There may also be a disproportionate cost to some areas of the coast under these alternatives. For instance, fixed gear fishermen fishing from Puget Sound ports may need to run further south as well as further off shore to fish productive grounds if the RCA is extended to deeper waters given the bathymetry of the area adjacent to the Juan de Fuca canyon.

Extending the northern non-trawl RCA further seaward would also affect fixed gear fishermen targeting Pacific halibut either in a directed fishery or incidental to sablefish targeting north of Pt. Chehalis. However, as summary data from the IPHC provided in Table 4-79 indicates, subarea extensions to deeper depths may not prohibit full attainment of commercial Area 2A halibut quotas given the significant proportion of halibut catch in depths greater than 125 fm. For instance, Table 4-79 indicates approximately 70% of the commercial halibut catch north of Pt. Chehalis occurred in depths greater than 125 fm. This compares to about 41% of the commercial halibut catch in depths greater than 125 fm in the area between 43° N latitude and Cascade Head. The same increased cost of fishing halibut can be posited if the RCA is extended seaward as was done above for sablefish targeting due to longer transits to open fishing grounds.

While it may be concluded that sablefish and halibut target opportunities may not be significantly affected by extending the non-trawl RCA seaward to reduce yelloweye impacts, it is likely that the small fixed gear fishery targeting spiny dogfish north of Pt. Chehalis would be significantly impacted. Those vessels targeting spiny dogfish seaward of the existing 100 fm RCA line in waters off northern Washington fish very close to the 100 fm line since that is where dogfish apparently congregate at certain times of the year. Past testimony of fishermen that participate in the target dogfish fishery off northern Washington was that extending the RCA to depths of 125 fm or deeper would terminate the fishery since they would be pushed seaward of those areas where dogfish aggregate.

Table 4-77. Limited entry fixed gear alternatives designed to progressively avoid yelloweye rockfish by moving all or a portion of the seaward boundary of the non-trawl RCA north of 40°10' N latitude from 100 fm to 125 and 150 fm.

Limited Entry Fixed Gear Alternatives		Longline						Pot		Yelloweye (mt)
		36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat	
LEFG Alt. 1	100 Fm								X	
	125 Fm									0.6
	150 Fm	X	X					X		
LEFG Alt. 2	100 Fm			X		X			X	
	125 Fm				X					0.7
	150 Fm	X					X	X		
LEFG Alt. 3	100 Fm								X	
	125 Fm		X							1
	150 Fm	X						X		
LEFG Alt. 4	100 Fm			X	X	X			X	
	125 Fm									1
	150 Fm	X					X	X		
LEFG Alt. 5	100 Fm			X	X	X			X	
	125 Fm						X			1.2
	150 Fm	X						X		
LEFG Alt. 6	100 Fm			X		X	X		X	
	125 Fm				X					1.2
	150 Fm	X						X		
LEFG Alt. 7	100 Fm		X						X	
	125 Fm									1.5
	150 Fm	X						X		

Table 4-78. The 2009-10 limited entry fixed gear management alternatives predicted to meet yelloweye impacts (denoted "*") under alternative catch sharing scenarios and OYs.

Management Measure Alternative	Catch Sharing Scenario	Predicted Total Catch (mt)	Yelloweye OY Alternatives							
			OY Alt. 2		OY Alt. 3		OY Alt. 4		OY Alt. 5	
			2009 13 mt	2010 14 mt	2009 17 mt	2010 14 mt	2009 15 mt	2010 15 mt	2009 17 mt	2010 17 mt
No Action		1.5	Fails	Fails	*	Fails	*	*	*	*
LEFG Alt. 1	2005%	0.6	*	*	*	*	*	*	*	*
	2007%		*	*	*	*	*	*	*	*
LEFG Alt. 2	2005%	0.7	*	*	*	*	*	*	*	*
	2007%		*	*	*	*	*	*	*	*
LEFG Alt. 3	2005%	1.0	*	*	*	*	*	*	*	*
	2007%		*	*	*	*	*	*	*	*
LEFG Alt. 4	2005%	1.0	*	*	*	*	*	*	*	*
	2007%		*	*	*	*	*	*	*	*
LEFG Alt. 5	2005%	1.2	*	*	*	*	*	*	*	*
	2007%		*	*	*	*	*	*	*	*
LEFG Alt. 6	2005%	1.2	*	*	*	*	*	*	*	*
	2007%		*	*	*	*	*	*	*	*
LEFG Alt. 7	2005%	1.5	Fails	Fails	*	Fails	*	*	*	*
	2007%		Fails	Fails	*	Fails	*	*	*	*

Table 4-79. Commercial halibut catch from directed commercial and incidental to sablefish longline fisheries associated with logbook data, 2003-2007 (weight: net weight pounds, excludes treaty tribes).

Region	Depth Category	Longline/Target Halibut	Longline/All Targets	All Gear/All Targets	All/All Distinct Vessels
North of Pt. Chehalis	100-124 fm	a/	55,065	55,065	25
	125-149 fm	a/	40,839	40,839	26
	≥150 fm	-	85,297	85,297	27
Cascade Head to Pt. Chehalis	100-124 fm	58,548	59,408	59,408	33
	125-149 fm	36,247	36,328	36,328	22
	≥150 fm	4,809	5,221	5,221	6
Col/Eur to Cascade Head	100-124 fm	183,092	183,092	184,542	67
	125-149 fm	245,905	245,905	245,905	55
	≥150 fm	53,619	53,619	53,619	21
OR/CA to Col/Eur	100-124 fm	b/	b/	b/	< 3

a/ < 3 vessels in the incidental to sablefish fishery set skates targeting halibut.
b/ < 3 vessels, poundage was added to the Col/Eur to Cascade Head category, Magnitude: less than 2% of the All/All log poundage total.

4.5.2.4 *Directed Open Access*

Fishing opportunities in the directed open access sector in 2009-10 will be limited by the available yield of yelloweye rockfish. There are two fishing strategies in the directed open access sector that incidentally catch yelloweye – the offshore sablefish DTL fishery and the nearshore commercial fisheries off California and Oregon. Adjustments to the seaward non-trawl RCA affect yelloweye impacts in the DTL fishery and adjustments to the shoreward boundary affect yelloweye impacts in the nearshore fisheries. Alternatives for the 2009-10 open access DTL fishery are based on the same adjustments to the seaward boundary of the non-trawl RCA north of 40°10' N latitude as the limited entry fixed gear fishery (Table 4-80).

Alternatives for the nearshore commercial fisheries are ranged by alternatively adjusting either the shoreward boundary of the northern non-trawl RCA from the status quo 30 fm line to the 20 fm line or by progressive reduction of trip limits to avoid yelloweye (Table 4-81). Table 4-81 also provides the predicted landed catch amounts of target nearshore groundfish species and depleted groundfish species associated with each alternative. From that table, it is clear that extending the northern RCA shoreward to 20 fm provides far more benefits to the fishery than trip limit reductions for the same amount of yelloweye bycatch savings.

Trip limits are also reduced in concert with shoreward RCA extensions under the nearshore alternatives to achieve yelloweye bycatch impacts down to the minimal levels required under low yelloweye OYs and the 2005 catch sharing scenario. *[GMT: What are the trip limits under the open access nearshore alternatives?]* While the Council guidance to use the shares under the 2005 and 2007 bycatch scorecards is helpful for initial analysis of management measures, there are some caveats regarding the data informing those scorecards that apply directly to the open access sector. At the end of 2004 when the initial 2005 scorecard was developed, there were few WCGOP observations of the nearshore commercial fleets; therefore, the 2005 catch shares may not be representative of actual bycatch rates in the fishery. The yelloweye impacts for the directed open access sector, which are largely in the nearshore fisheries, are much lower in the 2005 scorecard than the 2007 scorecard. At the end of 2006 when the initial 2007 scorecard was developed, many more observations of the nearshore commercial fishery were available. Also, the 2005 scorecard shows some yelloweye impact in the limited entry whiting trawl fishery (0.4 mt), while the 2007 scorecard shows no yelloweye bycatch in the whiting fisheries. The GMT believes the latter situation is much more plausible for the whiting fishery given that whiting are targeted by midwater small footrope trawls that would be destroyed in the high relief habitats where yelloweye occur. For these reasons, the GMT believes the yelloweye catch shares in the 2007 scorecard for the open access sector are much more representative of actual conditions.

The yelloweye impacts associated with the open access DTL and nearshore fisheries are compared against the yelloweye yields available to the entire sector under alternative catch shares and yelloweye OYs in Table 4-82. While this table compares the yelloweye impacts by alternative against the available yields in Table 2-8 independently for the DTL and nearshore fisheries, it is noted that the available yields in Table 2-8 are for the entire directed open access sector. Therefore, impacts from DTL and nearshore alternatives should be combined to determine whether alternatives for the entire sector stay within available yelloweye yields.

Table 4-80. Open access sablefish daily-trip-limit alternatives designed to progressively avoid yelloweye rockfish by moving all or a portion of the seaward boundary of the non-trawl RCA north of 40°10' N latitude from 100 fm to 125 and 150 fm.

Open Access DTL Alternatives		Longline						Pot		Yelloweye (mt)
		36° - 40°10' N lat	North of 40°10' N lat	40°10' - Col./Eur. line 43°	Col./Eur. line 43° - Cascade Head 45.064°	Cascade Head 45.064° - Pt. Chehalis 46.888°	North of Pt. Chehalis 46.888°	36° - 40°10' N lat	North of 40°10' N lat	
OA DTL Alt. 1	100 Fm								X	0.1
	125 Fm									
	150 Fm	X	X					X		
OA DTL Alt. 2	100 Fm			X		X			X	0.2
	125 Fm				X					
	150 Fm	X					X	X		
OA DTL Alt. 3	100 Fm								X	0.2
	125 Fm		X							
	150 Fm	X						X		
OA DTL Alt. 4	100 Fm			X	X	X			X	0.2
	125 Fm									
	150 Fm	X					X	X		
OA DTL Alt. 5	100 Fm			X	X	X			X	0.3
	125 Fm						X			
	150 Fm	X						X		
OA DTL Alt. 6	100 Fm			X		X	X		X	0.3
	125 Fm				X					
	150 Fm	X						X		
OA DTL Alt. 7	100 Fm		X						X	0.4
	125 Fm									
	150 Fm	X						X		

Table 4-81. Predicted landed catch (mt) of target nearshore groundfish species and total catch (mt) of depleted groundfish species under open access commercial nearshore fishery alternatives. Alternatives are based on alternative shoreward RCA boundaries north of 40°10' N latitude, alternative catch sharing scenarios based on either the 2005 or 2007 scorecard, and alternative trip limits.

Species	No Action (30 fm RCA boundary)	OA NS Alt. 1 (20 fm RCA; 2005 Catch Sharing)	OA NS Alt. 2 (30 fm RCA; 2005 Catch Sharing; Reduced Trip Limits)	OA NS Alt. 3 (20 fm RCA; 2005 Catch Sharing)	OA NS Alt. 4 (30 fm RCA; 2005 Catch Sharing; Reduced Trip Limits)	OA NS Alt. 5 (20 fm RCA; 2007 Catch Sharing)	OA NS Alt. 6 (30 fm RCA; 2007 Catch Sharing; Reduced Trip Limits)	OA NS Alt. 7 (20 fm RCA; 2007 Catch Sharing)	OA NS Alt. 8 (30 fm RCA; 2007 Catch Sharing; Reduced Trip Limits)	OA NS Alt. 9 (30 fm RCA; 2007 Catch Sharing; Reduced Trip Limits)
Southern Target Species										
Shallow nearshore species	54.1	30.74	12.72	40.98	16.96	112.70	46.64	122.95	50.88	63.60
Black Rockfish	4.4	2.24	0.93	2.98	1.23	8.20	3.39	8.94	3.70	4.63
Blue Rockfish	10.4	3.86	1.60	5.14	2.13	14.14	5.85	15.42	6.38	7.98
Other deeper nearshore species	31.2	16.82	6.96	22.43	9.28	61.68	25.52	67.29	27.84	34.80
Cabezon	22.5	12.29	5.09	16.39	6.78	45.08	18.65	49.18	20.35	25.44
Kelp Greenling	1.5	0.79	0.33	1.05	0.43	2.89	1.19	3.15	1.30	1.63
Lingcod	19.8	10.62	4.39	14.16	5.86	38.93	16.11	42.47	17.58	21.97
California Sheephead	31.8	17.32	7.17	23.10	9.56	63.52	26.29	69.30	28.68	35.84
All nearshore groundfish	175.8	94.67	39.18	126.23	52.24	347.14	143.65	378.69	156.71	195.89
Northern Target Species										
Black Rockfish	163.7	90.53	37.46	120.71	49.95	331.96	137.37	362.13	149.86	187.32
Blue Rockfish	19.8	7.27	3.01	9.69	4.01	26.64	11.02	29.06	12.03	15.03
Other minor nearshore rockfish	35.5	9.50	3.93	12.67	5.24	34.83	14.42	38.00	15.73	19.66
Cabezon	25.2	11.74	4.86	15.65	6.48	43.03	17.81	46.94	19.43	24.28
Kelp Greenling	18.2	9.50	3.93	12.67	5.24	34.83	14.42	38.00	15.73	19.66
Lingcod	62.0	33.53	13.88	44.71	18.50	122.95	50.88	134.12	55.50	69.38
All nearshore groundfish	324.4	162.07	67.06	216.09	89.42	594.24	245.90	648.26	268.26	335.32
Rebuilding Species										
Canary	3.04	1.24	0.71	1.66	0.93	4.64	2.58	4.96	2.8	3.51
Bocaccio	0.02	0.01	0	0.01	0.01	0.02	0.02	0.03	0.02	0.02
Widow	0.05	0.02	0.01	0.03	0.01	0.08	0.04	0.08	0.04	0.05
Yelloweye	1.30	0.3	0.3	0.4	0.4	1.1	1.1	1.2	1.2	1.50

Table 4-82. The 2009-10 open access DTL and nearshore management alternatives predicted to meet yelloweye impacts (denoted "*") under alternative catch sharing scenarios and OYs.

Sector	Management Measure Alternative	Catch Sharing Scenario	Predicted Total Catch (mt)	Yelloweye OY Alternatives							
				OY Alt. 2		OY Alt. 3		OY Alt. 4		OY Alt. 5	
				2009 13 mt	2010 14 mt	2009 17 mt	2010 14 mt	2009 15 mt	2010 15 mt	2009 17 mt	2010 17 mt
Directed Open Access (DTL sablefish)	No Action	2005%	0.4	Fails	Fails	*	Fails	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA sable Alt. 1	2005%	0.1	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA sable Alt. 2	2005%	0.2	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA sable Alt. 3	2005%	0.2	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA sable Alt. 4	2005%	0.2	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA sable Alt. 5	2005%	0.3	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA sable Alt. 6	2005%	0.3	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA sable Alt. 7	2005%	0.4	Fails	Fails	*	Fails	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
Directed Open Access (OR, CA Nearshore)	No Action	2005%	1.4	Fails	Fails	Fails	Fails	Fails	Fails	Fails	Fails
		2007%		Fails	*	*	*	*	*	*	*
	OA NS Alt. 1	2005%	0.1	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OA NS Alt. 2	2005%	0.6	Fails	Fails	Fails	Fails	Fails	Fails	Fails	Fails
		2007%		*	*	*	*	*	*	*	*
	OA NS Alt. 3	2005%	0.8	Fails	Fails	Fails	Fails	Fails	Fails	Fails	Fails
		2007%		*	*	*	*	*	*	*	*
	OA NS Alt. 4	2005%	1.0	Fails	Fails	Fails	Fails	Fails	Fails	Fails	Fails
		2007%		*	*	*	*	*	*	*	*
	OA NS Alt. 5	2005%	1.2	Fails	Fails	Fails	Fails	Fails	Fails	Fails	Fails
		2007%		Fails	*	*	*	*	*	*	*

4.5.2.5 *Incidental Open Access*

Incidental Catch of Lingcod in the Salmon Troll Fishery

At the April 2008 meeting, the Council approved for public review two options that would allow retention of lingcod in the salmon troll fishery:

- Option 1: Allow the retention of 1 lingcod for every 15 Chinook salmon, plus one additional lingcod, not to exceed 10 lingcod per trip, up to a maximum limit of 400 lbs/month.

- Option 2: Allow the retention of 1 lingcod for every 20 Chinook salmon, plus one additional lingcod, not to exceed 10 lingcod per trip, up to a maximum limit of 400 lbs/month.[4]

Both options would change current regulations to allow retention of lingcod caught inside the RCA. Neither option would permit retention of lingcod caught in Washington state waters. The number of lingcod that could be retained under both options at different levels of Chinook landed is displayed in Table 4-83.

Table 4-83. Number of lingcod allowed and Chinook-to-lingcod ratio based on Chinook landed in the salmon troll fishery under 2009-10 options for lingcod retention.

Chinook Caught on Trip	15	25	30	40	50	60	75	100	135	150	200
Option 1: 15-to-1, +1											
Lingcod allowance	2	2	3	3	4	5	6	7	10	10	10
Chinook per lingcod	7.5	10.0	10.0	13.3	12.5	12.0	12.5	14.3	13.5	15.0	20.0
Option 2: 20-to-1, +1											
Lingcod allowance	1	2	2	3	3	4	4	6	7	8	10
Chinook per lingcod	15.0	12.5	15.0	13.3	16.7	15.0	18.8	16.7	19.3	18.8	20

A similar retention allowance of 1 lingcod for every 10 Chinook was considered during the 2007-2008 management measures process. The Council rejected that proposal out of concern that it might lead salmon trollers to target lingcod.[5] Targeting is of concern because it would presumably increase bycatch of canary and yelloweye based on the known co-occurrence of the three species. No information would be available to quantify or monitor the magnitude of these presumed impacts because the salmon troll fleet is not covered by the WCGOP.

Some empirical information on the rate of lingcod bycatch in the salmon troll fishery is available from a WDFW study that deployed observers in the commercial salmon troll fleet off the Washington coast during the 2003, 2004 and 2005 fishing seasons. Observed effort represented approximately 4 percent of the total WA troll effort and landed Chinook over the three-year period of the study. The observed ratios of Chinook-to-lingcod were 24-to-1 in 2003, 14-to-1 in 2004, and 7-to-1 in 2005. The average ratio across all three years of the study was 12-to-1. Because lingcod retention was prohibited during the study, these observed ratios can be assumed to represent truly incidental catches of lingcod. However, the representativeness of the data to the entire coast and current conditions is questionable given the limited observer coverage, geographic area, and duration of the study.

The "plus 1" feature of Option 1 and Option 2 causes the effective Chinook-per-lingcod ratio of the two options to vary depending on the amount of Chinook caught (Table 4-83). A gap between this ratio and the "true" incidental Chinook per lingcod bycatch rate would create the potential for targeting. However, for this potential to occur, there would also need to be an economic incentive to target. Large revenues from retained lingcod combined with low costs of the extra fishing activity required to catch them would create a strong incentive. In contrast, small revenues and high costs of targeting would translate into a weak incentive.

The cost side of the equation cannot easily be evaluated. Targeting could involve additional travel and search time, yet it is also feasible that trollers could target lingcod at little or no additional cost.

[4] *Supplemental WDFW Motion in Writing*, Agenda Item H.5.e. April 2008

[5] [add 2007-2008 FEIS citation, (section 4.5.4.3, p. 401)]

Revenues, on the other hand, can be evaluated. Revenue available to trollers from a retention allowance would be foremost a function of the number of lingcod that could be retained with only non-incidental lingcod contributing to the incentive to target. Table 4-84 shows what the maximum non-incidental catch of lingcod would be for Option 1 and Option 2 under four alternative scenarios of the natural or "true" Chinook per lingcod bycatch ratio.

Catch per unit effort (CPUE) in the troll fishery was 21 Chinook per boat day fished in 2005, 10 Chinook per boat day in 2006, and 11 Chinook per boat day in 2007.[6] A Chinook trip can last longer than a single day but landings of more than 50 Chinook have been rare under these recent CPUE levels. In Washington, the West Coast state with the highest CPUE during the period, 95-99 percent of the landings consisted of less than 50 fish; and, the majority of landings consisted of less than 15 fish (Table 4-85). And in 2008, trollers are fishing under trip limits of 50 or 35 Chinook. If these regulations or CPUE levels continue in 2009-2010, then the most non-incidental lingcod expected on a Chinook trip would be four fish under Option 1 or three fish under Option 2. Under the WDFW observed average ratio, the majority of landings would result in one non-incidental lingcod under Option 1 and zero under Option 2.

Table 4-84. Estimated non-incidental catch ("+") and regulatory discard ("-") of lingcod for Option 1 and Option 2 under four scenarios of the "true" Chinook-to-lingcod bycatch rate.

Chinook caught on Trip	**15**	**25**	**30**	**40**	**50**	**60**	**75**	**100**	**135**	**150**	**200**
Zero incidental catch											
Lingcod encountered	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Option 1	+2	+2	+3	+3	+4	+5	+6	+7	+10	+10	+10
Option 2	+1	+2	+2	+3	+3	+4	+4	+6	+7	+8	+10
12-to-1 incidental catch (WDFW observed average)											
Lingcod encountered	*1*	*2*	*2*	*3*	*4*	*5*	*6*	*8*	*11*	*12*	*16*
Option 1	+1	0	+1	0	0	0	0	-1	-1	-2	-6
Option 2	0	0	0	0	-1	-1	-2	-2	-4	-4	-6
30-to-1 incidental catch (low natural bycatch)											
Lingcod encountered	*0*	*0*	*1*	*1*	*1*	*2*	*2*	*3*	*4*	*5*	*6*
Option 1	+2	+2	+2	+2	+3	+3	+4	+4	+6	+5	+4
Option 2	+1	+2	+1	+2	+2	+2	+2	+3	+3	+3	+4
7-to-1 incidental catch (high natural bycatch)											
Lingcod encountered	*2*	*3*	*4*	*5*	*7*	*8*	*10*	*14*	*19*	*21*	*28*
Option 1	0	-1	-1	-2	-3	-3	-4	-7	-9	-11	-18
Option 2	-1	-1	-2	-2	-4	-4	-6	-8	-12	-13	-18

[6] *See* Table I-4in PFMC, *Review of 2007 Ocean Salmon Fisheries* (2008).

Table 4-85. Washington Chinook landings frequency statistics, 2005-2007.

Chinook Landed	2005			2006			2007		
	# of Landings	% of Landings	Cum.	# of Landings	% of Landings	Cum.	# of Landings	% of Landings	Cum.
15	1,490	65.52%	65.5%	1,504	82.32%	82.3%	1,476	83.01%	83.0%
30	425	18.69%	84.2%	244	13.36%	95.7%	237	13.33%	96.3%
50	241	10.60%	94.8%	63	3.45%	99.1%	61	3.43%	99.8%
75	71	3.12%	97.9%	6	0.33%	99.5%	4	0.22%	100.0%
100	46	2.02%	100.0%	8	0.44%	99.9%	0	0.00%	100.0%
>100	1	0.04%	100.0%	2	0.11%	100.0%	0	0.00%	100.0%

The average price paid per fish is the second major factor to consider in evaluating possible revenues. According to PacFIN 2005-2007 landings data, the price of troll and other hook and line caught lingcod on the West Coast ranged from $0.40 per pound to $3.08 per lb with an average of $1.24 per lb. The best available information on the average size of lingcod comes from the 2004 NMFS Trawl Survey where males averaged 48.9 cm in length and females 51 cm.[7] Using the length-weight conversion from the latest stock assessment, these lengths correspond to average weights of 2.4 lbs for males and 2.6 lbs for females.[8] However, lingcod encountered in the salmon troll fishery in 2009-2010 would likely be larger because of growth in the population over since 2004. Table 4-86 displays potential revenue that could be earned from a single lingcod based on a range of fish weights and exvessel prices.

Table 4-86. Potential revenue earned per lingcod under various possible average weights and exvessel prices.

Avg. Price/lb Weight	$0.80	$1.30	$1.60	$1.80	$2.25
2.5 lb	$2.00	$3.25	$4.00	$4.50	$5.63
5.0 lb	$4.00	$6.50	$8.00	$9.00	$11.25
8.0 lb	$6.40	$10.40	$12.80	$14.40	$18.00
10.0 lb	$8.00	$13.00	$16.00	$18.00	$22.50
12.0 lb	$9.60	$15.60	$19.20	$21.60	$27.00
15.0 lb	$12.00	$19.50	$24.00	$27.00	$33.75

Applying the per lingcod revenues from Table 4-86 to the estimates of non-incidental catch in Table 4-84 establishes some bounds on what the overall economic incentives to target could be Option 1 and Option 2. For example, if the Option 2 retention allowance were adopted and 95-99 percent of salmon troll trips continued to land less than 50 Chinook, then revenues available from targeting would be between $0 and $101.25 (three, 15 lb lingcod at $2.25 per lb).

Given the decision to target lingcod occurs on a trip-by-trip basis, the 400lb monthly lingcod limit included in Option 1 and Option 2 would not have much influence on the incentive to target unless a troller was near enough to the limit that it affected how many lingcod could be retained on a trip. At an average weight of 15lb, it would take 27 lingcod to exceed the 400 lb limit. And with a landing of 50

[7] Keller, A. A., et. al. (2007). *The 2004 U.S. West Coast bottom trawl survey of groundfish resources off Washington, Oregon, and California: Estimates of distribution, abundance, and length composition*. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-87, 134 p.

[8] *See* Table 16 in Jagielo, T.H. and Wallace, F.R. (2005). *Assessment of Lingcod (Ophiodon elongatus) for the Pacific Fishery Management Council in 2005.*

Chinook or less, the highest number of lingcod a troller could retain is four. Under such circumstances, the 400lb limit might affect the incentive to target if a troller makes more than six trips in a month.

4.5.2.6 *Tribal*

The canary and yelloweye impacts associated with the proposed 2009-10 tribal management measures are provided in Table 2-5.

4.5.2.7 *Washington Recreational*

The WDFW is proposing to allow incidental groundfish retention caught in deeper waters in Marine Areas 3 and 4 on days when Pacific halibut fishing is allowed. The regulation is due to the habitats where halibut are caught off the north Washington coast and the distribution of rockfish and lingcod there. The distribution of rockfish on the Washington coast is directly linked to the bottom topography. The northern coast is characterized by high relief rocky habitat with many offshore rocks, pinnacles and canyons. The rocky habitat transitions through rock/cobble bottom to a sandy/muddy flat bottom as you move south toward the Columbia River. Lingcod tend to inhabit the same areas as halibut off the north coast, which often results in their incidental catch when anglers are targeting halibut. Off the central and southern coast, halibut can be found on flat, sandy bottom offshore, whereas lingcod tend to occur in rocky areas closer to shore. Anglers fishing the south coast will typically target halibut in one area, and then change their location to target lingcod. Regulations are in place in Marine Areas 1 and 2 (along Washington's southern coast) that prohibit the retention of lingcod and rockfish during halibut trips. These rules are intended to discourage targeting of lingcod offshore where yelloweye rockfish may occur. However, as noted above, because lingcod and yelloweye are commonly encountered while targeting halibut in the northern area, such regulations would likely not accomplish the same result.

The predicted total catches of canary and yelloweye rockfish by 2009-10 alternative Washington recreational management measures are shown in Table 4-87.

Table 4-87. Predicted total catches (mt) of canary and yelloweye rockfish by 2009-10 alternative management measures for the Washington recreational fishery.

2009-10 Washington Recreational Alternatives	Marine Area	Predicted Total Catches (mt)	
		Canary	Yelloweye
No Action Alt.	3 & 4 (N. Coast)	0.97	2.25
	2 (S. Coast)	0.05	0.23
	1 (Col. River)	0.01	0.02
	Total	1.0	2.5
WA Rec. Alt. 1	3 & 4 (N. Coast)	0.59	1.51
	2 (S. Coast)	0.04	0.20
	1 (Col. River)	0.01	0.02
	Total	0.6	1.7
WA Rec. Alt. 2	3 & 4 (N. Coast)	0.63	1.54
	2 (S. Coast)	0.04	0.21
	1 (Col. River)	0.01	0.02
	Total	0.7	1.8
WA Rec. Alt. 3	3 & 4 (N. Coast)	0.70	1.70
	2 (S. Coast)	0.04	0.21
	1 (Col. River)	0.01	0.02
	Total	0.7	1.9

The yelloweye impacts associated with the alternative Washington recreational management measures are compared against the available yelloweye yields under alternative catch shares and yelloweye OYs in Table 4-88. The No Action Alternative exceeds the available yelloweye yield under OYs less than 17 mt and Washington Recreational Alternatives 2 and 3 under the 2005 catch sharing scenario exceed the available yelloweye yields under the 13 mt yelloweye OY.

Table 4-88. The 2009-10 Washington recreational management alternatives predicted to meet yelloweye impacts (denoted "*") under alternative catch sharing scenarios and OYs.

Sector	Management Measure Alternative	Catch Sharing Scenario	Predicted Total Catch (mt)	Yelloweye OY Alternatives							
				OY Alt. 2		OY Alt. 3		OY Alt. 4		OY Alt. 5	
				2009 13 mt	2010 14 mt	2009 17 mt	2010 14 mt	2009 15 mt	2010 15 mt	2009 17 mt	2010 17 mt
Washington Recreational	No Action		2.5	Fails	Fails	*	Fails	Fails	Fails	*	*
	WA Rec. Alt. 1	2005%	1.7	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	WA Rec. Alt. 2	2005%	1.8	Fails	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	WA Rec. Alt. 3	2005%	1.9	Fails	*	*	*	*	*	*	*
		2007%		Fails	*	*	*	*	*	*	*

4.5.2.8 *Oregon Recreational*

The predicted total catches of important groundfish species by 2009-10 alternative Oregon recreational management measures are shown in Table 4-89.

Table 4-89. Predicted total catches (mt) of important groundfish species by 2009-10 alternative management measures for the Oregon recreational fishery.

Species	2009-10 Oregon Recreational Alternatives						
	No Action Alt.	OR Rec. Alt 1	OR Rec. Alt 2	OR Rec. Alt 3	OR Rec. Alt 4	OR Rec. Alt 5	OR Rec. Alt 6
Canary	2.3	1.7	2.0	2.2	2.3	2.6	2.5
Yelloweye	2.2	1.6	1.8	2.0	2.2	2.5	2.5
Black	371.8	356.5	430.1	430.1	371.8	278.5	283.6
Blue	28.8	24.5	33.4	33.4	28.8	21.7	22.2
Brown	0.1	0.1	0.1	0.1	0.1	0.1	0.1
China	3.3	3.3	3.8	3.8	3.3	2.5	2.5
Copper	6.5	6.3	7.2	7.2	6.5	5.3	5.3
Grass	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Quillback	5.6	5.6	6.5	6.5	5.6	4.1	4.2
Lingcod	119.1	104.8	119.1	119.1	119.1	119.1	119.1
Kelp Greenling	19.7	19.5	20.4	20.4	19.7	18.5	18.6
Cabezon	29.8	28.3	34.4	34.4	29.8	22.7	23.0

The yelloweye impacts associated with the alternative Oregon recreational management measures are compared against the available yelloweye yields under alternative catch shares and yelloweye OYs in Table 4-90.

Table 4-90. The 2009-10 Oregon recreational management alternatives predicted to meet yelloweye impacts (denoted "*") under alternative catch sharing scenarios and OYs.

Sector	Management Measure Alternative	Catch Sharing Scenario	Predicted Total Catch (mt)	Yelloweye OY Alternatives							
				OY Alt. 2		OY Alt. 3		OY Alt. 4		OY Alt. 5	
				2009 13 mt	2010 14 mt	2009 17 mt	2010 14 mt	2009 15 mt	2010 15 mt	2009 17 mt	2010 17 mt
Oregon Recreational	No Action		2.2	Fails	Fails	*	Fails	Fails	Fails	*	*
	OR Rec. Alt. 1	2005%	1.6	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	OR Rec. Alt. 2	2005%	1.8	Fails	*	*	*	*	*	*	*
		2007%		Fails	*	*	*	*	*	*	*
	OR Rec. Alt. 3	2005%	2.0	Fails	Fails	*	Fails	*	*	*	*
		2007%		Fails	Fails	*	Fails	*	*	*	*
	OR Rec. Alt. 4	2005%	2.2	Fails	Fails	*	Fails	Fails	Fails	*	*
		2007%		Fails	Fails	*	Fails	*	*	*	*
	OR Rec. Alt. 5	2005%	2.5	Fails	Fails	*	Fails	Fails	Fails	*	*
		2007%		Fails	Fails	*	Fails	Fails	Fails	*	*
	OR Rec. Alt. 6	2005%	2.5	Fails	Fails	*	Fails	Fails	Fails	*	*
		2007%		Fails	Fails	*	Fails	Fails	Fails	*	*

4.5.2.9 *California Recreational*

The 2008 California recreational groundfish season is shown in Figure 2-13. The predicted total catches of important groundfish species by 2009-10 alternative California recreational management measures are shown in Table 4-91. *Note that the alternative seasons are revised from the Chapter 2 description of alternative 2009-10 California recreational groundfish seasons. Go to Agenda Item F.4.b, Supplemental CDFG Report for the revised seasons. Chapter 2 will be updated accordingly after the June 2008 Council meeting.*

The yelloweye impacts associated with the alternative California recreational management measures are compared against the available yelloweye yields under alternative catch shares and yelloweye OYs in Table 4-92.

Table 4-91. Predicted total catch (mt) of important groundfish species by alternative 2009-10 management measures for the California recreational fishery.

Species	Mgt. Area	2009-10 California Recreational Alternatives					
		Revised CA Rec. Alt 1	Revised CA Rec. Alt 2	Revised CA Rec. Alt 3	Revised CA Rec. Alt 4	Revised CA Rec. Alt 5	Revised CA Rec. Alt 6
Canary	N	0.1	0.3	0.5	0.5	0.6	0.5
	NCN	0.0	0.1	0.3	0.3	0.4	0.9
	NCS	2.4	3.8	3.8	3.8	3.8	3.8
	SC - Mont	1.4	1.5	1.4	1.4	1.4	1.5
	SC - Morro	0.7	0.8	0.7	0.7	0.7	0.8
	S	0.3	0.3	0.3	0.3	0.3	0.3
	Total	4.9	6.8	7.0	7.0	7.2	7.8
Yelloweye	N	0.1	0.4	0.6	0.7	0.8	0.7
	NCN	0.1	0.2	0.4	0.4	0.6	1.4
	NCS	0.3	0.5	0.5	0.5	0.5	0.5
	SC - Mont	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.5	1.1	1.5	1.6	1.9	2.6
Black	N	16.2	52.5	58.9	74.3	80.4	74.3
	NCN	1.6	3.1	5.3	5.3	7.5	11.9
	NCS	27.6	31.2	31.2	31.2	31.2	31.2
	SC - Mont	6.2	6.5	6.2	6.2	6.2	6.5
	SC - Morro	2.8	2.9	2.8	2.8	2.8	2.9
	S	0.0	0.0	0.0	0.0	0.0	0.0
	Total	54.4	96.2	104.4	119.8	128.1	126.8
Blue	N	0.9	3.1	3.5	4.4	5.3	4.4
	NCN	0.9	1.7	3.0	3.0	4.2	6.7
	NCS	48.8	72.2	72.2	72.2	72.2	72.2
	SC - Mont	17.8	20.0	17.8	17.8	17.8	20.0
	SC - Morro	48.2	54.1	48.2	48.2	48.2	54.1
	S	11.3	11.4	11.4	11.4	11.4	11.4
	Total	127.9	162.5	156.1	157.0	159.1	168.8
Bocaccio	N	-	-	-	-	-	-
	NCN	0.0	0.0	0.0	0.0	0.0	0.1
	NCS	2.0	3.1	3.1	3.1	3.1	3.1
	SC - Mont	2.9	3.0	2.9	2.9	2.9	3.0
	SC - Morro	3.4	3.5	3.4	3.4	3.4	3.5
	S	34.5	39.9	39.9	39.9	39.9	39.9
	Total	42.8	49.5	49.3	49.3	49.3	49.6
Cabezon	N	1.3	2.3	2.7	3.3	3.7	3.3
	NCN	0.7	0.7	1.3	1.3	1.9	3.0
	NCS	4.7	5.4	5.4	5.4	5.4	5.4
	SC - Mont	0.7	0.8	0.7	0.7	0.7	0.8
	SC - Morro	1.7	2.0	1.7	1.7	1.7	2.0
	S	7.6	7.6	7.6	7.6	7.6	7.6
	Total	16.7	18.8	19.4	20.0	21.0	22.1

Table 4-91. Predicted total catch (mt) of important groundfish species by alternative 2009-10 management measures for the California recreational fishery (continued).

Cowcod	N	-	-	-	-	-	-
	NCN	0.0	0.0	0.0	0.0	0.0	0.0
	NCS	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Mont	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	0.1	0.1	0.1	0.1	0.1	0.1
	Total	0.1	0.1	0.1	0.1	0.1	0.1
Widow	N	0.0	0.0	0.0	0.0	0.0	0.0
	NCN	0.0	0.0	0.0	0.0	0.0	0.0
	NCS	0.3	0.7	0.7	0.7	0.7	0.7
	SC - Mont	2.3	2.5	2.3	2.3	2.3	2.5
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	1.1	2.8	2.8	2.8	2.8	2.8
	Total	3.7	6.0	5.8	5.8	5.8	6.0
Shallow NS	N	-	-	-	-	-	-
	NCN	0.5	0.9	1.5	1.5	2.1	3.3
	NCS	14.2	20.4	20.4	20.4	20.4	20.4
	SC - Mont	8.8	9.5	8.8	8.8	8.8	9.5
	SC - Morro	14.2	15.3	14.2	14.2	14.2	15.3
	S	8.5	8.6	8.6	8.6	8.6	8.6
	Total	46.2	54.7	53.5	53.5	54.1	57.1
Deeper NS	N	-	-	-	-	-	-
	NCN	2.0	3.9	6.8	6.8	9.7	15.5
	NCS	97.1	145.4	145.4	145.4	145.4	145.4
	SC - Mont	40.2	44.6	40.2	40.2	40.2	44.6
	SC - Morro	72.9	80.8	72.9	72.9	72.9	80.8
	S	53.1	53.4	53.4	53.4	53.4	53.4
	Total	265.3	328.1	318.7	318.7	321.6	339.7
Other Minor North Rockfish	N	1.2	8.3	9.4	11.8	14.1	9.4
	NCN	-	-	-	-	-	-
	NCS	-	-	-	-	-	-
	SC - Mont	-	-	-	-	-	-
	SC - Morro	-	-	-	-	-	-
	S	-	-	-	-	-	-
	Total	1.2	8.3	9.4	11.8	14.1	9.4
CA Scorpionfish	N	-	-	-	-	-	-
	NCN	0.0	0.0	0.0	0.0	0.0	0.0
	NCS	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Mont	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	43.4	43.5	43.5	43.5	43.5	43.5
	Total	43.4	43.5	43.5	43.5	43.5	43.5

Table 4-91. Predicted total catch (mt) of important groundfish species by alternative 2009-10 management measures for the California recreational fishery (continued).

Greenlings	N	0.3	0.5	0.6	0.7	0.8	0.7
	NCN	0.6	0.6	0.9	0.9	1.3	2.0
	NCS	1.5	2.1	2.1	2.1	2.1	2.1
	SC - Mont	0.4	0.4	0.4	0.4	0.4	0.4
	SC - Morro	0.1	0.1	0.1	0.1	0.1	0.1
	S	0.0	0.0	0.0	0.0	0.0	0.0
	Total	2.9	3.7	4.1	4.2	4.7	5.3
Lingcod	N	10.9	20.4	24.4	29.9	34.9	29.9
	NCN	3.8	3.8	7.1	7.1	7.1	16.9
	NCS	57.3	80.4	80.4	80.4	80.4	80.4
	SC - Mont	8.2	9.1	8.2	8.2	8.2	9.1
	SC - Morro	22.4	24.7	22.4	22.4	22.4	24.7
	S	33.8	34.8	34.8	34.8	34.8	34.8
	Total	136.4	173.2	177.3	182.8	187.8	195.8

Table 4-92. The 2009-10 California recreational management alternatives predicted to meet yelloweye impacts (denoted "*") under alternative catch sharing scenarios and OYs.

Sector	Management Measure Alternative	Catch Sharing Scenario	Predicted Total Catch (mt)	Yelloweye OY Alternatives							
				OY Alt. 2		OY Alt. 3		OY Alt. 4		OY Alt. 5	
				2009 13 mt	2010 14 mt	2009 17 mt	2010 14 mt	2009 15 mt	2010 15 mt	2009 17 mt	2010 17 mt
California Recreational	No Action	2005%	4.1	~~Fails~~	~~Fails~~	*	~~Fails~~	~~Fails~~	~~Fails~~	*	*
		2007%		~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~
	Revised CA Rec. Alt. 1	2005%	1.1	*	*	*	*	*	*	*	*
		2007%		*	*	*	*	*	*	*	*
	Revised CA Rec. Alt. 2	2005%	1.2	*	*	*	*	*	*	*	*
		2007%		~~Fails~~	*	*	*	*	*	*	*
	Revised CA Rec. Alt. 3	2005%	1.7	*	*	*	*	*	*	*	*
		2007%		~~Fails~~	~~Fails~~	*	~~Fails~~	~~Fails~~	~~Fails~~	*	*
	Revised CA Rec. Alt. 4	2005%	1.8	*	*	*	*	*	*	*	*
		2007%		~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~
	Revised CA Rec. Alt. 5	2005%	2.1	~~Fails~~	*	*	*	*	*	*	*
		2007%		~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~
	Revised CA Rec. Alt. 6	2005%	2.8	~~Fails~~	~~Fails~~	*	~~Fails~~	~~Fails~~	~~Fails~~	*	*
		2007%		~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~	~~Fails~~

4.5.3 Discussion of the Council-Preferred Alternative

This section to be completed after the June 2008 Council meeting.

Rebuilding Consequences of Delaying the Yelloweye Rockfish Ramp-down and Maintaining an OY of 17 mt in 2010

At the April 2008 PFMC meeting, the Council requested analysis of an additional rebuilding alternative for yelloweye rockfish. In this new alternative, the OY would be set at 17 mt in both 2009 and 2010, rather than being reduced to 14 mt in 2010. This option has been evaluated using Dr. Andre Punt's *Rebuilding Analysis* program and the 2007 assessment update, and the results are summarized in Table 1, below.

Columns one and two of Table 1 replicate columns one and four of Table 3a in the 2007 yelloweye rebuilding analysis. The third column of Table 1 reports the results for setting a 17 mt in 2010 and keeping the ramp-down's constant Spawning Potential Rate (SPR) after 2010 equal to 71.9%. This option extends the 'Median Year to Rebuild' by one-tenth of a year, and the probability of rebuilding by the current T_{Target} of 2084 is reduced by two-tenths of one percent.

Results presented in the last column of Table 1 are based on maintaining the 'Median Year to Rebuild' at 2082.0, by allowing the constant harvest rate after 2010 to decrease. This results in an SPR of 71.94%, which translates into a two-hundreds of a metric ton reduction in the 2011 and 2012 OY's. Over the long rebuilding times, this reduced fishing rate results in a probability of rebuilding that is *slightly* higher than the other two scenarios.

Table 1. Rebuilding parameters for the increased tonnage ramp-down scenario. Results obtained by applying the *Rebuilding Analysis* program to the 2007 assessment update data.

Alternative	(From the 2007 rebuilding doc., with increased precision reported inside the brackets.) 3. SPR = 0.719 (From Amendment 16-4)	Increased Ramp-down Same Constant SPR after 2011	Increased Ramp-down Same Median Year to Rebuild (to the tenth of a year)
Ramp-Down Used	Yes	Yes	Yes
SPR (Constant, starting in 2011)	0.719	0.719	**0.7194**
1 - SPR	0.281	0.281	0.2806
2009 (Rampdown)	17	17	17
2010 (Rampdown)	14	**17**	**17**
2011 OY/ABC (mt)	13.9/ 32.5	13.89/ 32.40	13.87/32.40
2012 OY/ABC (mt)	14.2/ 33.1	14.17 / 33.07	14.15/33.07
Median Year to Rebuild	2082 [2082.0]	2082.1	2082.0
Percent Prob. to Rebuild by: 2046 (T_{MIN})	0.0	0.0	0.0
2050	0.0	0.0	0.0
2060	2.6	2.5	2.5
2070	17.7	17.5	17.7
2080	45.1	44.8	45.0
2084 (T_{TARGET})	54.9	54.7	55.0
2090 (T_{MAX})	68.9	68.6	68.9

Yelloweye Rockfish Recreational Harvest Guideline Catch-Sharing Options for the 2009-2010 Regulatory Specifications and Implications for the California Recreational Fishery

Since 2000, west coast states have modified their recreational fishery regulations to meet constraining harvest guidelines (HGs) for bocaccio, cowcod, canary rockfish, yelloweye rockfish and lingcod. Yelloweye rockfish is now the most constraining species in the recreational fisheries of Washington, Oregon and northern California north of Point Arena. More conservative recreational alternatives are being developed by all three states to meet lower optimal yields (OYs) for yelloweye rockfish for the 2009-2010 seasons so that harvest limits are not exceeded. Equitable and valid catch-sharing criteria need to be applied to the OY alternative selected for yelloweye rockfish by the Pacific Fishery Management Council (Council), so that recreational fishing opportunity in any one state is not disproportionately reduced.

Yelloweye Rockfish Optimum Yields

Yelloweye rockfish were declared “overfished” based on the first assessment of the stock in 2002, and since then the stock has been managed under strict rebuilding plans. The OYs have varied annually from 22 metric tons (mt) in 2003 and 2004, up to 27 mt in 2006, and down to 20 mt in 2008. In 2006, the Council chose a “ramp down” strategy to set OYs for 2007-2008 at 23 and 20 mt respectively, with lower allowable harvests each year until 2011.

The most recent assessment was completed in 2007 and the proposed OY alternatives for 2009-2010 are derived from that assessment’s rebuilding plan. The OY alternatives are even lower than past years ranging from 13 to 17 mt; under some alternatives, the values decline from 2009 to 2010. At the March 2008 Council meeting, the Council chose preliminary preferred OYs for yelloweye rockfish of 17 mt (2009) and 14 mt (2010). Generally, when developing management measures for the two year cycle, measures are designed to keep within the lowest year’s OY.

Fishery Sector Apportionment

The apportionment of catch among sectors is dependent on the OY adopted by the Council. After an OY is adopted, it is assigned among all fishery sectors, including various directed commercial fishery sectors, and the recreational fisheries in Washington, Oregon, and California. Each sector manages their fishery to their “allocation” based on their proposed management measures.

The tribal fisheries, Open Access incidental fishery sectors, research and Exempted Fishing Permit set asides are not affected by the adopted OY and their “set aside” is not changed under any OY or catch sharing alternatives (they are typically thought of as the “unchangeables”). The current combined total projected catch of these “unchangeable” sectors represents approximately 6 mt that is “taken off the top” before the remainder of the OY is divided among the other sectors. As a result, the portion remaining to the other commercial and recreational sectors will be determined based on the OY finally adopted in June and on the specific catch-sharing strategy used to apportion catch.

Recreational Fishery Sector Catch Sharing and Harvest Guidelines

Catch-sharing strategies can be based on past catches if management measures are not changing, past projected impacts, past HGs, or on projected future impacts. The strategy may be based on actual tonnage if the OY has not changed or, when the OY has increased or decreased, the strategy may be based on percentages of the OY which can be used to determine the amount (mt) that each sector receives. Sharing among the three states’ recreational fisheries may be based on dividing up a separate recreational portion set aside, or considered along with the other sectors when the OY is divided up. Formal HGs are set for the recreational fisheries and may be set individually or combined between states (see Table 1). California and the other states design their management measures to meet their HGs.

In 2005, the OY was 26 mt, the resulting total combined recreational HG was 13.1 mt, and the California HG was set at 3.7 mt. In 2006, the OY was 27 mt, the combined annual recreational HG for all three states was 10.4 mt, and the California HG was also 3.7 mt, which represented 36 percent of the entire recreational HG. In 2006, the estimated catch in California’s recreational fishery nearly reached its HG, at 3.5 metric tons (with a 30 fm depth restriction in the

Northern Management Area and a 20 fm depth restriction in the North-Central Management Area).

The current 2007-2008 catch-sharing, which differs from that of 2006, resulted from a set-aside for the recreational fishery that was divided among states based on projected impacts in addition to past HG and catch information. In 2007 and 2008, with 23 mt and 20 mt OYs respectively, the respective annual recreational HGs for all states combined were 10.4 mt and 8.9 mt (Table 1). By state, the recreational HGs adopted for management for both 2007 and 2008 were 3.5 (WA), 3.3 (OR), and 2.1 (CA), totaling 8.9 mt, providing California with only 24 percent of the entire recreational yelloweye rockfish HG, down from 36 percent in 2006.

Because the lower 2008 8.9 mt HG was the number used for developing management measures rather than 10.4 mt, a residual 1.5 mt unassigned recreational “buffer” existed in 2007, which provided all states some insurance against any overage of recreational catch. This 1.5 mt buffer disappeared in 2008 when the OY decreased to 20 mt, and the HG decreased to 8.9 mt, requiring all states to manage stringently to ensure their portion of the HG was not exceeded.

When California did its projection modeling in 2006 for the 2007-08 management cycle, it projected that its management measures would constrain yelloweye rockfish catches to a level below its 2.1 mt allocation. At the time, management measures were designed specifically to constrain take of canary rockfish, rather than yelloweye rockfish, as canary rockfish was the most limiting species off California. The result was a May-December season in the Northern Management Area and June-November in the North-Central Management Area with a 30 fm depth restriction in both areas.

Table 1. Recreational Harvest Guidelines for Yelloweye Rockfish 2005-2008

Harvest Guideline (Metric Tons)			
Year	**CA**	**OR**	**WA**
2005	3.7	9.4	
2006	3.7	3.2	3.5
2007*	2.1	3.3	3.5
2008	2.1	3.3	3.5

*Note: 2007 also allowed 1.5 mt of unassigned recreational HG “buffer” to be shared between states as needed

California Recreational Catch Projection Methodology

California uses a catch projection model to develop season and depth measures that will meet constraining HG alternatives. The model makes assumptions about catch by month and in depth bins and then sums the totals to determine estimated impacts. The projection of the 2007 HG for the California recreational fishery was based on a model projection that did not accurately reflect the proportion of catch by depth and proportion of catch by month for yelloweye rockfish. The resulting under-projection of yelloweye rockfish impacts resulted in a California yelloweye rockfish recreational HG of 2.1 mt for 2007 and 2008, lower than the previous 3.7 mt in 2006. Because California projected these lower yelloweye rockfish catches under the canary management measures, it relinquished the unaccounted-for portion of their 2006 yelloweye rockfish recreational HG (3.7 – 2.1) to the other states to minimize the need for further reductions in Oregon and Washington’s recreational fisheries management strategy in 2007-2008.

Re-Projection of the 2007-2008 Recreational Impacts

California subsequently revised its projection model to make better use of recent sample data from the California Recreational Fisheries Survey (CRFS) program and to more accurately represent the yelloweye rockfish catch in the Northern and North-Central Management Areas.

- The proportion of catch by depth information has been revised and now uses more recent catch data from CRFS to produce more current, region–specific proportions of catch by depth with a higher sample size than previously available, thus providing improved projections that represent the current distribution of catch. The revised proportions of catch by depth indicate that the previous proportions under-projected the proportion of catch derived from depths between 20 and 30 fathoms.

- The monthly distribution of catch has also been revised to better reflect the proportion of catch accruing in a given month with season restrictions in place, addressing the apparent "opener effect" resulting from anglers fishing in greater numbers early in the season than they had historically under a year round season. The previous proportions of catch under projected the proportion of catch accruing in the first few months of the season resulting in an under-projection of catch by mid season.

The revised model was used to recalculate the estimated 2007 and 2008 projected catch using the same 2004 and 2005 base data and the 2007-2008 regulations used in the previous model. With only changes to catch by depth and monthly distribution of catch, the new model's projected impacts for 2007 and 2008 were 3.0 mt; considerably above prior estimates.

Recreational Fishery Allocations for 2009-2010

The reduced OY options for 2009-2010 mean that additional constraints to all of the recreational fisheries will be needed to meet lower HGs. As a result, a re-examination of the catch-sharing arrangement is needed, since the impacts differ considerably between the states in terms of impact to fishing seasons and depth constraints. Three options have been developed based on Council guidance, as described below, which would allocate the allowable recreational HG using different percentages.

At the November 2007 Council meeting, the Council gave the GMT direction on recreational catch-sharing for *initial* analyses of the 2009-2010 recreational yelloweye rockfish impacts. This guidance included using the status quo proportion of the combined recreational "allocation" relative to the other fishery sectors. The GMT used the recreational HGs for 2007 as the basis for catch-sharing among recreational sectors in these initial analyses.

Due to concerns regarding the validity of the current catch sharing using the 2007 HG, the Council requested at the April 2008 meeting that the GMT analyze the HGs for each state's recreational fishery that would result from three recreational HG catch-sharing options. The recreational catch-sharing criteria are described below for each option and represent the percentages that would be applied to the new lower OY values to determine the actual HG amounts. Actual percentages for each state under the three options are provided in Table 2.

Option 1. The same percentages determined from 2007 recreational Harvest Guidelines, which is the Status Quo (SQ).

Option 2. The percentages calculated from 2007 Harvest Guidelines for Washington and Oregon, and using a re-projection of the 2007 California recreational impacts.

Option 3. The percentages determined from the 2006 Recreational Harvest Guidelines for the three states.

Table 2. The three recreational harvest guideline catch-sharing options and the respective state shares in percentages.

Catch-sharing Option	Criteria	Washington Catch-sharing Percentage	Oregon Catch Sharing Percentage	California Catch-sharing Percentage
1	2007 SQ HG	39%	37%	24%
2	Re-projected 2007 CA Catch	36%	34%	31%
3	2006 HG	34%	31%	36%

Option 1 – Each State's Allowance for 2009-10 follows from the 2007 Catch Sharing Arrangement

The harvest guidelines for the recreational fishery in 2007 were 2.1 mt in California, 3.3 mt in Oregon and 3.5 metric tons in Washington. The harvest guidelines for each of the OY options for 2009-2010 using the 2007 catch sharing arrangement are provided in Table 3 below.

Table 3. Catch-sharing Option 1: 2009-2010 Recreational Harvest Guidelines based on proportions derived from the 2007 Status Quo Harvest Guidelines

Coastwide 2009-2010 Yelloweye Optimum Yield Alternatives (Metric Tons)			
	13	**14**	**17**
Recreational Harvest Guidelines (mt)			
Washington (39% of HG)	1.8	2.1	2.8
Oregon (37% of HG)	1.7	1.9	2.6
California (24% of HG)	1.1	1.2	1.7
WA-OR-CA Rec HG Total *	4.6	5.1	7.1

* If the PFMC chooses to apportion catch among all sectors, rather than within the recreational sector, the overall and state totals would change. See Table 6.

Option 2 - Each State's Allowance for 2009-10 follows from the 2007 Catch Sharing Arrangement, but Adjusts 2007 Projections Following From Model Improvements

As an alternative to the 2007 HG catch sharing option (Option 1 above), the Council directed the GMT to use the revised California catch projection model described above to project what the 2007 catch would have been using the improved model, and use the resulting predicted catch in lieu of the 2.1 mt harvest guideline for California in apportioning catch. The revised model projected a California recreational yelloweye rockfish catch of 3 mt. The catch sharing percentages for the recreational harvest guideline calculated from 2007 Harvest Guidelines for Washington (3.5 mt) and Oregon (3.3 mt), and the 3 mt projection of the 2007 California recreational impacts provide the basis for this catch sharing option. The resulting percentages of the coast-wide recreational yelloweye rockfish Harvest Guideline and the corresponding harvest guideline under each OY under consideration by the Council are provided in Table 4.

Table 4. Catch-sharing Option 2: 2009-2010 Recreational Harvest Guidelines using Proportions derived from the 2007 Washington and Oregon Harvest Guidelines and the Re-projected 2007 California Recreational Impacts

Coastwide 2009-2010 Yelloweye Optimum Yield Alternatives (Metric Tons)			
	13	**14**	**17**
Recreational Harvest Guidelines (mt)			
Washington (36% of HG)	1.6	1.8	2.5
Oregon (34% of HG)	1.6	1.7	2.4
California (31% of HG)	1.4	1.6	2.2
WA-OR-CA Rec HG Total *	4.6	5.1	7.1

* If the PFMC chooses to apportion catch among all sectors, rather than within the recreational sector, the overall and state totals would change. See Table 6.

Option 3 - Each State's Allowance for 2009-10 follows from the 2006 Catch Sharing Arrangement

Although improved, the California recreational model still runs some risk of under-estimating projected catches of yelloweye rockfish. The third catch sharing alternative under consideration would utilize the 2006 recreational HGs as the basis for catch sharing. In 2006, the estimated catch of 3.5 mt in the California recreational fishery nearly reached the 3.7 mt HG. The catch sharing percentages and Harvest Guidelines for yelloweye rockfish catch that would result from application of the 2006 proportions as the basis for catch sharing are provided in Table 5 below.

Table 5. Catch-sharing Option 3: 2009-2010 Recreational Harvest Guidelines Based on Proportions Derived from the 2006 Harvest Guidelines

Coastwide 2009-2010 Yelloweye Optimum Yield Alternatives (Metric Tons)			
	13	**14**	**17**
Recreational Harvest Guidelines (mt)			
Washington (34% of HG)	1.6	1.7	2.4
Oregon (31% of HG)	1.4	1.6	2.2
California (36% of HG)	1.6	1.8	2.5
WA-OR-CA Rec HG Total *	4.6	5.1	7.1

* If the PFMC chooses to apportion catch among all sectors, rather than within the recreational sector, the overall and state totals would change. See Table 6.

Analysis of Recreational Catch Sharing Alternatives

All states will have to reduce recreational opportunities under the preferred 14 mt OY alternative for yelloweye rockfish. The following discussion is intended to illustrate the differences in recreational fishing opportunity among states with status quo 2007 HG catch sharing option (Option 1) and the 2006 HG catch sharing option (Option 3). The opportunity available in each state under Option 2 is intermediate to options 1 and 3. As a result, Option 2 is not specifically analyzed.

<u>Option 3 Analysis</u>

Under Option 3, Washington and Oregon recreational fisheries will receive a lower percentage of the HG than under the status quo 2007 HG sharing. In Oregon, the HG would be 1.6 mt for 2009 compared with 3.3 mt in 2008. Washington would have a 1.7 mt HG for 2009 compared with a 3.5 mt HG in 2008, and California would have a 1.8 mt HG for 2009 compared with 2.1 mt in 2008.

Under the Option 3 scenario, the following fishery management measures are anticipated to be required to constrain recreational fisheries to these levels:

- Oregon would have a five month season with a 25 fm depth restriction and a 6-rockfish bag limit.
- Washington would have a year-round season and a 10 rockfish bag limit

and fishing allowed at all depths (except a 20 fm depth restriction would be in effect from May 1 to Sept. 30th in three of four management areas).

- California would have a three month season in the Northern Management Area and a one-and-a-half month season in the North-Central Management Area North of Point Arena with a 20 fm depth restriction and a five month season in the North-Central Management Area South of Point Arena with a 30 fm depth restriction with a 10 fish bag limit in all areas (see Table 6).

Table 6: California Recreational Season Structure and Depth Restrictions under the 14 mt OY, Option 3 (1.8 mt yelloweye rockfish HG)

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North Region	---	---	---	---	Open <20fm			---	---	---	---	---
North Central N. of Pt. Arena	---	---	---	---	---	<20fm---July 15		---	---	---	---	---
North Central S. of Pt. Arena	---	---	---	---	---	Open <30fm					---	---
South Central - Monterey	---	---	---	---	Open <40fm							---
South Central - Morro Bay	---	---	---	---	Open <40fm							---
South Region	---	---	Open < 60fm									

NOTES AND KEY:
RCG = Rockfish, cabezon, greenlings
--- = Closed to boat-based fishing for RCG
In the South Region, CA scorpionfish is open 12 months: 0-40 fm January-February, 0-60 fm in March-December.

California would have an increased percentage of the HG under Option 3, however, seasons and depth restrictions in Oregon and Washington would still be significantly more liberal than in California.

Option 1 Analysis

Use of the Option 1 catch-sharing arrangement under the Council's preferred yelloweye rockfish OY alternative (14 mt) would result in severe reductions in the catch allotted to California in the 2009 and 2010 seasons, and the required management measures to constrain catches would be extreme. In Oregon, the HG would be 1.8 mt for 2009 compared with 3.3 mt in 2008. Washington would have a 1.7 mt HG for 2009 compared with a 3.5 mt HG in 2008, and California would have only 1.1 mt HG for 2009 compared with 2.1 mt in 2008.

Under the Option 1 scenario, the following fishery management measures are anticipated to be required to constrain recreational fisheries to these levels:

- Oregon would have a year-round season with a 30 fm depth restriction and a 6 fish bag limit.

- Washington would have a year-round season and a 10 rockfish bag limit and fishing allowed at all depths (except a 20 fm depth restriction would be in effect from May 1 to Sept. 30^{th} in three of four management areas).
- California would have only a two month season in the Northern Management Area and a one month season in the North-Central Management Area North of Pt. Arena with a 20 fm and a 4 month season in the North-Central Management Area South of Point Arena with a 30 fm depth restriction. A 10 fish bag limit would remain in effect in all areas (see Table 7).

Table 7: California Recreational Season Structure and Depth Restrictions under the 14 mt OY, Option 1 (1.2 mt HG)

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North Region	---	---	---	---	Open <20fm		---	---	---	---	---	---
North Central N. of Pt. Arena	---	---	---	---	---	<20fm	---	---	---	---	---	---
North Central S. of Pt. Arena	---	---	---	---	---	Open <30fm				---	---	---
South Central - Monterey	---	---	---	---	Open <40fm							---
South Central - Morro Bay	---	---	---	---	Open <40fm							---
South Region	---	---	Open < 60fm									

NOTES AND KEY:
RCG = Rockfish, cabezon, greenlings
--- = Closed to boat-based fishing for RCG
In the South Region, CA scorpionfish is open 12 months: 0-40 fm January-February, 0-60 fm in March-December.

Revisitation of Catch Sharing Arrangements with Commercial Sectors

The previous discussions of catch sharing options only considered evaluation of options *within* the recreational sector to derive the state recreational Harvest Guidelines. If the Council considers re-evaluation of catch-sharing *among all sectors*, the approaches of the three catch sharing options described above would be used to determine the proportions of the OY by sector that are applied to the entire OY (after removing 6 mt for the "unchangeables" described above). This "all sector" approach would result in different percentages of the OY being used to set the recreational HGs than those provided in Tables 3-5.

The recreational harvest guidelines resulting from the application of the three catch sharing options described above to reapportion the OY among recreational and commercial sectors assuming a 14 mt OY are shown in Table 8. Under the "Rec Only" Catch-Sharing columns of Table 6 the commercial harvest guidelines remain the same and only the portion of the 5.1 mt recreational HG given to each state's recreational fishery varies.

Comparison of harvest guidelines between "Rec Only" and "All Sectors" columns provides insight into the implications of only applying catch sharing rules to the recreational HGs as opposed to applying them to the sharing of the entire OY. The harvest guidelines in Option 1 do not differ between the "Rec Only" and "All Sectors" columns since this is the status quo catch sharing option and the catch sharing percentages for each sector do not differ between the columns. The harvest guidelines for Option 3 decrease greatly for the directed open access fishery (.98 mt) and the increase of all other sectors varies from .02 to .43 mt in the "All Sectors" Catch-Sharing column. The decrease in the open access fishery harvest guideline for Option 3 under the "All Sectors" Catch-Sharing will require shallower depth restrictions and severely decreased trip limits to stay within the harvest guideline and provide year round fishing opportunity.

While the comparison of the harvest guidelines for "Rec Only" Catch-Sharing to "All Sectors" Catch-Sharing bears out the implications for each sector under the catch sharing options, the Council may propose additional ways of sharing the yelloweye rockfish catch in the 2009-2010 season.

Table 8. Yelloweye rockfish Harvest Guidelines by sector for the 14 mt Council-preferred 2010 OY alternative for each of the three catch-sharing options applied to recreational HG sharing (Rec Only Catch-Sharing) and applied to the OY apportioning catch between all sectors (All Sectors Catch-Sharing).

	Harvest Guideline in Metric Tons					
	Rec Only Catch-Sharing			All Sectors Catch-Sharing		
Sector	Option 1 2007 HG	Option 2 2007 Re-Projection.	Option 3 2006 HG	Option 1 2007 HG	Option 2 2007 Re-Projection	Option 3 2006 HG
LE Trawl Non-Whiting	0.06	0.06	0.06	0.06	0.05	0.22
LE Trawl-Whiting	0.00	0.00	0.00	0.00	0.00	0.22
OA: Directed	1.40	1.40	1.40	1.40	1.32	0.34
LE Fixed Gear	1.34	1.34	1.34	1.34	1.26	1.40
Rec: WA	2.04	1.86	1.75	2.04	1.92	1.96
Rec: OR	1.93	1.75	1.60	1.93	1.81	1.79
Rec: CA	1.23	1.59	1.85	1.23	1.64	2.07
WA-OR-CA Rec Subtotal	5.20	5.20	5.20	5.20	5.37	5.82
Sub-Total **"Unchangeables"** **Total**	8.00 6.00 14.0	8.00 6.00 14.0	8.00 6.00 14.0	8.00 6.00 14.0	8.00 6.00 14.0	8.00 6.00 14.0

Practical Range of Management Specification Options for California's 2009-2010 Commercial and Recreational Groundfish Fisheries

COMMERCIAL

Specific Fishing Area Prohibitions

Proposals for incorporating yelloweye rockfish conservation areas (YRCA) into the management specifications are being considered off Crescent City. Coordinates for proposed commercial YRCAs off Crescent City are the same as the recreational fishery (Appendix 2, Point St. George & South Reef)).

Changes to Rockfish Conservation Area (RCA) Lines

Proposals to modify RCA lines to more closely approximate depth contours were reviewed by CDFG and Enforcement staff. These changed are being considered in the following areas:

60 fathom	**100 fathom**	**250 fathom**
Morro Bay	Pioneer Canyon	Tolo Banks
Northern Channel Islands (west end)	Westport	
Santa Cruz Island (Sandstone Point)		
Santa Rosa Island (east point)		
San Clemente Island (west end)		
Catalina Island (west end)		
Santa Monica Bay		
San Diego		

Minor nearshore rockfish options (North of 40°10' N lat.)

Possible trip limit restructuring or reductions are being considered based on the need to manage blue rockfish. Results of analyses will be provided at the June Pacific Fishery Management Council meeting.

Cabezon

Revisions to cabezon trip limits will be considered by California under its state management process after the Council's final adoption of an optimal yield (OY) at the June 2008 meeting.

Lingcod

- Consider decreasing minimum size limit from 24 inches total length (TL) to 22 inches TL

RECREATIONAL
Inseason management actions were taken at the September 2007 Council meeting to close the Northern and North-Central Management Areas on October 1. Despite the inseason action, the 2.1 mt harvest guideline for yelloweye rockfish was exceeded by 5.9 mt and the 9 mt harvest guideline for canary rockfish was exceeded by 1.9 mt. To prevent the harvest guidelines from being exceeded for yelloweye and canary rockfish in 2008 while maximizing the fishing opportunity for the recreational fishery, in May the depth restriction has been reduced to 20 fathoms (fm) in the Northern and North-Central Management Area.

Figure 1 below depicts the 2009-10 season and depth structure under the “no action alternative.” The projections of catch for the 2008 season indicate that despite the additional inseason constraints on depth, a reduced season length may be necessary later in the year to prevent the harvest guideline for yelloweye rockfish from being exceeded if 2008 catch and effort trends are similar to 2007. Additionally, uncertainties around the impacts of the salmon fishery closure on the groundfish fishery in the north make it more challenging to anticipate angler effort in 2008

Yelloweye rockfish will be the most constraining species for the Northern and North-Central North of Point Arena Management Areas in 2009-2010. Over 98% of the catch of yelloweye rockfish in 2007 was taken North of Point Arena (Mendocino County) so to limit the geographic extent of any action necessary in 2008 to minimize bycatch of yelloweye rockfish, a management line at Point Arena (N Latitude 38°57’) will be used to subdivide the North-Central Management Area. The result will be two management areas to be referred to as the North-Central Management Area North of Point Arena and the North-Central Management Area South of Point Arena.

The 2009-2010 season management alternatives for the California recreational fishery have been developed to prevent the harvest guidelines of overfished species and species of concern from being exceeded. Final 2009-2010 harvest guidelines for the overfished species and other species of concern are dependent on the final Optimum Yield (OY) adopted by the Council and will be determined at the June 2008 meeting. Yelloweye rockfish will be the most constraining species for the Northern and North-Central Management Areas north of Point Arena. In the, Morro Bay South-Central Management Area, Monterey South-Central Management Area and North-Central Management Area South of Pt. Arena, blue rockfish and Minor Nearshore Rockfish South will be the most constraining groups. In the Southern Management Area, cowcod and bocaccio are the most constraining species. The depth restriction and season length diagrams below include shallower depth restrictions in the Northern and North-Central Management Area North of Point Arena. Due to the lower mortality on yelloweye rockfish in the North-Central Management Area south of Point Arena, relaxing the depth constraint to 30 fathoms to access species of shelf rockfish that would be included within the aggregate RCG complex bag limit of 10 fish is being considered to reduce impacts on the minor nearshore rockfish group which are likely to be constraining in this area in 2009-2010.

Range of Season and Depth Alternatives

The depth restrictions and season lengths resulting from a 13-mt yelloweye rockfish OY under a the status quo 2007 HG criteria for recreational HG sharing (see Figure 2), and17-mt yelloweye rockfish OY with a 2006 HG criteria for recreational HG sharing (see Figure 3) provide the extremes of the range of the recreational fishing opportunity. Implementation of yelloweye rockfish conservation areas or reductions in bag limits in the 2009-2010 seasons could be considered secondarily to constrain catches in some areas in order to provide a longer fishing season. Use of the 2006 HG catch sharing alternative as opposed to the present 2007 HG used for apportionment of the recreational harvest guideline for initial analysis would result in appreciably more opportunity in the northern California recreational fishery, making the season length more comparable to that of Oregon and Washington recreational fisheries. For additional information and specifics, please refer to the briefing book document entitled "Yelloweye Rockfish Recreational Harvest Guideline Catch-Sharing Options for the 2009-2010 Regulatory Specifications and Implications for the California Recreational Fishery" for more information.

The depth restrictions and season lengths resulting from the no action alternative (2008 status quo after the September 2007 inseason action) are provided for purposes of comparison to predicted future seasons. Implementation of YRCAs or reduced bag limits possibly could increase the season length in 2009-2010, and additional information on the implications of these management measures for season length will be provided in a CDFG supplemental report at the June Council meeting. At public meetings regarding the 2009-2010 regulations, stakeholder input indicated that anglers were not in favor of a reduction in bag limits given that only a 20% reduction in catch is anticipated under a reduction to a 6-fish bag limit.

In developing the YRCAs proposed in 2008, only areas in state waters could be considered without a Federal Environmental Impact Statement (FEIS). Areas in Federal waters are now available for consideration of YRCA placement in 2009-2010 since they will be analyzed in the FEIS for 2009-2010. The input provided at the public meetings and a reanalysis of areas in both state and federal water resulted in development of the YRCAs in appendix 2. Catch savings analysis from these proposed areas are under development and estimates of potential catch savings that would result from their implementation may be provided at the June Council meeting.

The following additional changes to existing recreational management measures are proposed for consideration:

- Increase the bag limit for cabezon from 1 to 2 fish in some management areas.
- Increase the bag limit for bocaccio from 1 to 2 fish in some management areas south of 40-10.
- Increasing the bag limit for kelp greenling from 1 to 2 fish in some management areas.
- Elimination of gear restrictions for sanddabs and other flatfishes.
- Include Petrale sole in the group of sanddabs and other flatfish allowed during season closures.

- Reduce the size limit for lingcod north of Point Arena to 22 inches.
- Modify existing bag limits and bag compositions to better allow for take of unconstrained species and improve avoidance of constraining species (i.e., adjustments to existing RCG complex regulations).

Season and Depth Restriction Diagrams

Note that in the following season diagrams the following apply:

- All divers and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish and other federal groundfish. (Note: use of boats is permitted while diving for rockfish or other closed but not prohibited species during closed periods, provided no hook and line gear is on board or in possession)
- Exemptions to season restrictions for the retention and possession of leopard sharks in specified bays and estuaries by boat based anglers still apply in 2009-2010.
- The retention and possession of sanddabs and "other flatfishes" are exempt from season and depth restrictions.

Figure 1. Current California recreational fishery seasons and depth constraints, designed under a 23 mt yelloweye OY constraint; a 2.1 mt California yelloweye HG; current 10-fish bag limit and 2007 Status Quo HG Catch Sharing. NOTE: This figure is shown only to depict current seasons and depth structure and is not an option for 2009-10 based on reductions that will be made to the yelloweye OY for 2009-10.

California Adopted 2007-08 Management Option

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North Region	---	---	---	---	Open <20fm							
North Central	---	---	---	---	---	Open <20fm						---
South Central - Monterey	---	---	---	---	Open <40fm							---
South Central - Morro Bay	---	---	---	---	Open <40fm							---
South Region	---	---	Open < 60fm									

NOTES AND KEY:
RCG = Rockfish, cabezon, greenlings
--- = Closed to boat-based fishing for RCG
In the South Region, CA scorpionfish is open 12 months: 0-40 fm January-February, 0-60 fm in March-December.

Figure 2. California recreational seasons and depth restrictions for 2009-10 designed under a 13 mt yelloweye OY (most restrictive OY alternative), a 1.1 mt California yelloweye HG (least beneficial for CA season length); current 10-fish bag limit and 2007 Status Quo HG Catch Sharing.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North Region	---	---	---	---	Open <20fm		---	---	---	---	---	---
North Central N. of Pt. Arena	---	---	---	---	---	<20fm	---	---	---	---	---	---
North Central S. of Pt. Arena	---	---	---	---	---	Open <30fm				---	---	---
South Central - Monterey	---	---	---	---	Open <40fm							---
South Central - Morro Bay	---	---	---	---	Open <40fm							---
South Region	---	---	Open < 60fm									

NOTES AND KEY:
RCG = Rockfish, cabezon, greenlings
--- = Closed to boat-based fishing for RCG
In the South Region, CA scorpionfish is open 12 months: 0-40 fm January-February, 0-60 fm in March-December.

Projected catch of constrained species for 2009-10 designed under a 13 mt yelloweye OY (most restrictive OY alternative), a 1.1 mt California yelloweye HG derived from 2007 Status Quo HG Catch Sharing (least beneficial for CA season length), and the current 10-fish bag limit.

Species	Projected Catch (mt)
Bocaccio	49.48
Canary	6.98
Yelloweye	1.07
Widow	5.95
Cowcod	0.10

Figure 3. California Recreational Season and Depth Restrictions under the 17 mt yelloweye OY (most liberal OY alternative), a 2.6 mt California yelloweye HG derived from 2006 HG Catch Sharing (most beneficial for CA season structure), and the current 10-fish bag limit.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North Region	---	---	---	---	Open <20fm				---	---	---	---
North Central N. of Pt. Arena	---	---	---	---	---	Open <20fm		---	---	---	---	---
North Central S. of Pt. Arena	---	---	---	---	---	Open <30fm				---	---	---
South Central - Monterey	---	---	---	---	Open <40fm							---
South Central - Morro Bay	---	---	---	---	Open <40fm							---
South Region	---	---	Open < 60fm									

NOTES AND KEY:
RCG = Rockfish, cabezon, greenlings
--- = Closed to boat-based fishing for RCG
In the South Region, CA scorpionfish is open 12 months: 0-40 fm January-February, 0-60 fm in March-December.

Projected catch of constrained species for 2009-10 designed under a 17 mt yelloweye OY (most restrictive OY alternative), a 2.6 mt California yelloweye HG derived from 2007 Status Quo HG Catch Sharing (most beneficial for CA season length), and the current 10-fish bag limit.

Species	Projected Catch (mt)
Bocaccio	50.88
Canary	8.43
Yelloweye	2.45
Widow	6.41
Cowcod	0.10

Appendices:

Appendix 1. Yelloweye Rockfish Conservation Areas (YRCAs) Previously Proposed in State Waters for 2008

The following are descriptions of the five proposed Yelloweye Rockfish Conservation Areas that are contained entirely within state waters and were previously considered for 2008 inseason management purposes. Public comments were received on these proposed areas at the 2008 and 2009-2010 public meetings regarding the proposed implementation of the YRCAs proposed below. Subsequently, the Department has analyzed alternatives including four additional areas that include both federal and state waters (see Appendix 2).

Point St. George YRCA (Del Norte County)
Defined as the area within state waters between a line extending due West through the NOAA buoy off of Point St. George at 41° 51' 00" North latitude and a line extending due West from Castle Rock at 41° 45' 40" North latitude; from shore to the state/federal water boundary.

Punta Gorda YRCA (Humboldt County)
Defined as the area within state waters between a line extending due West from the Punta Gorda Lighthouse at 40° 15' 15" North latitude and a line extending due West from Reynolds Creek mouth at 40° 12' 00" North latitude; from shore to the state/federal water boundary.

Point Delgada YRCA (Humboldt County)
Defined as the area within state waters south of a line extending due West from Yellow Bluff at 40° 02' 35" North latitude and West of a line extending due South from Dead Man's Gulch at 124° 03' 26" West longitude, to the state/federal water boundary.

Bells Point YRCA (Mendocino County)
The area within state waters between a line extending due West from Switzer Rock 39° 38' 50" North latitude and a line extending due West from Kibesillah Rock at 39° 34' 08" North latitude; from shore to the state/federal water boundary.

Point Cabrillo YRCA (Mendocino County)
The area within state waters between a line extending due West from Hare Creek 39° 25' 00" North latitude and a line extending due West from Point Cabrillo 39° 21' 00" North latitude; from shore to the state/federal water boundary.

Appendix 2. YRCAs in State and Federal Water Proposed for 2009-2010

The following areas are proposed YRCAs for possible use in the 2009-2010 season. The savings that would result from implementation of these areas are still being analyzed. These areas may be refined by public input in addition to the results of the catch savings analysis.

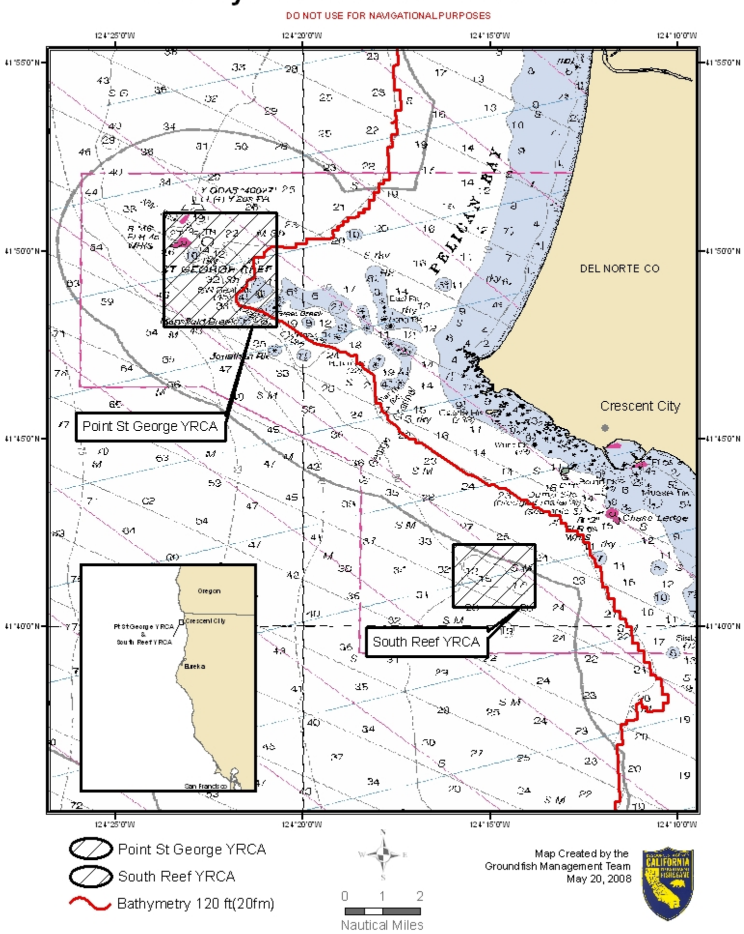
Point St. George

41˚ 51.00' N. lat. 124˚ 23.75' W. long.
41˚ 51.00' N. lat. 124˚ 20.75' W. long.
41˚ 48.00' N. lat. 124˚ 20.75' W. long.
41˚ 48.00' N. lat. 124˚ 23.75' W. long.

South Reef

41˚ 42.20' N. lat. 124˚ 16.00' W. long.
41˚ 42.20' N. lat. 124˚ 13.80' W. long.
41˚ 40.50' N. lat. 124˚ 13.80' W. long.
41˚ 40.50' N. lat. 124˚ 16.00' W. long.

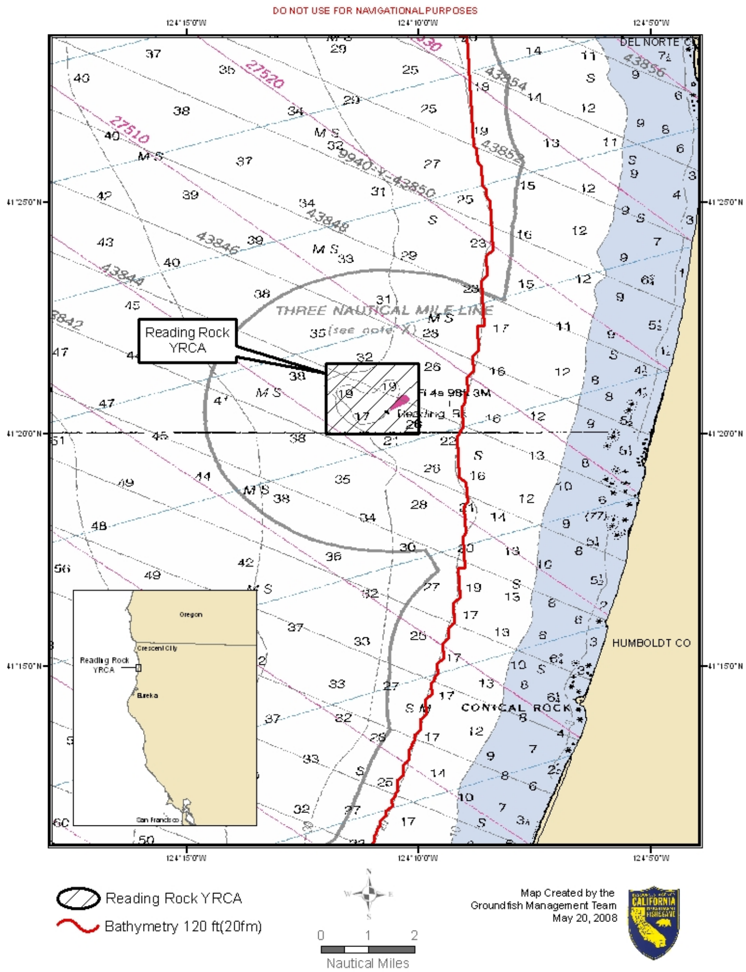
Point St. George & South Reef
Yelloweye Rockfish Conservation Area



Reading Rock

41˚ 21.50' N. lat. 124˚ 12.00' W. long.
41˚ 21.50' N. lat. 124˚ 10.00' W. long.
41˚ 20.00' N. lat. 124˚ 10.00' W. long.
41˚ 20.00' N. lat. 124˚ 12.00' W. long.

Reading Rock Yelloweye Rockfish Conservation Area

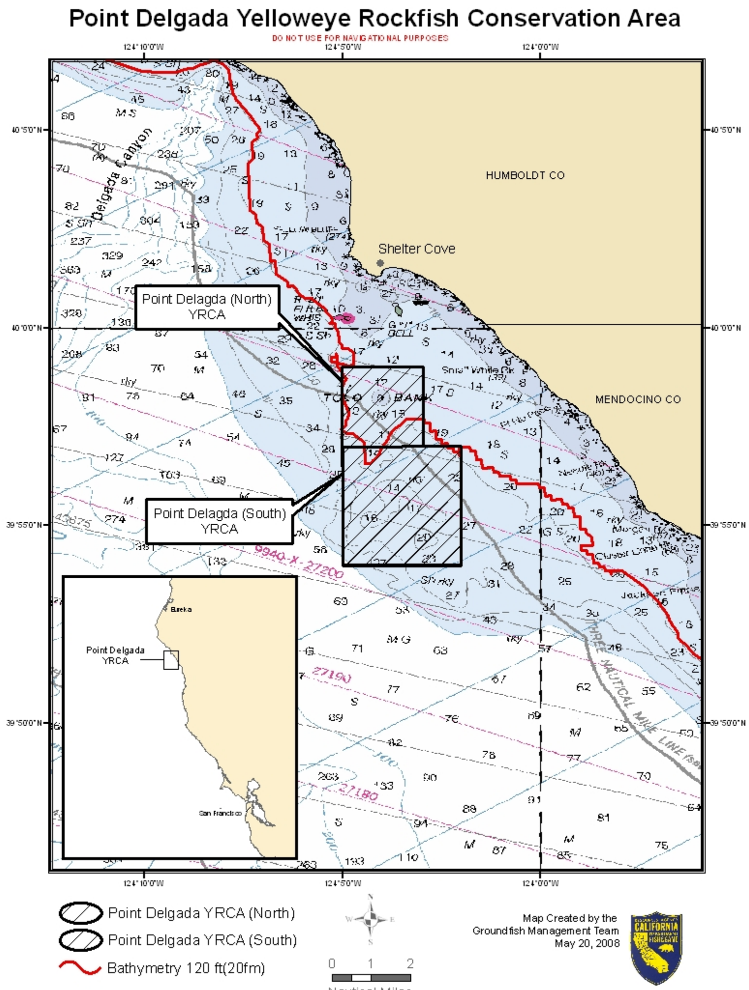


Point Delgada (north)

39˚ 59.00' N. lat. 124˚ 5.00' W. long.
39˚ 59.00' N. lat. 124˚ 3.00' W. long.
39˚ 57.00' N. lat. 124˚ 3.00' W. long.
39˚ 57.00' N. lat. 124˚ 5.00' W. long.

Point Delgada (south)

39˚ 57.00' N. lat. 124˚ 5.00' W. long.
39˚ 57.00' N. lat. 124˚ 2.00' W. long.
39˚ 54.00' N. lat. 124˚ 2.00' W. long.
39˚ 54.00' N. lat. 124˚ 5.00' W. long.



Agenda Item F.4.b
Supplemental CDFG Report 3
June 2008

Revisions to Chapter 2 and Chapter 4 for the 2009-2010 California Recreational Fishery Management Measures

Introduction: The revised sections of Chapter 2 and Chapter 4 below reflect changes to the method used in the California recreational model regarding application of the depth dependent mortality rate to yelloweye and canary rockfish. In California in 2007, fish that could not be observed were recorded by samplers as being either unavailable dead (B1 fish), or discarded alive (B2 fish). The revised analytical approach is consistent with the approach used by both Oregon and Washington, and applies the depth-dependent mortality rates previously approved by the GMT to a fraction of B2 fish and the portion of the B1 fish that were discarded dead. A further explanation of this methodology is provided in the Modeling of California Recreational Impacts section 4.5.1.9.

The revisions described below are intended to replace the specified sections in the draft EIS provided in the briefing book.

Revisions to Section 2.2.4.2

California Recreational

CDFG is proposing to add a new marine management area in 2009-2010 by dividing the North-Central management area north and south of Pt. Arena. This will allow for differing seasons and depth constraints in the two areas driven by differing observed impact rates to yelloweye rockfish. The following management measures are analyzed and discussed in section 4.5.4.9 of this EIS.

2009-2010 Season Alternatives

Alternatives 1 though 6 below describe the range of season and depth management measures for the 2009-2010 California recreational groundfish fishery that would be required under varying OY constraints for yelloweye, bocaccio, canary, cowcod, widow, and blue rockfish. Seasons and depths are prescribed for each management area separately, including the two new areas (North-Central North of Pt. Arena and North-Central South of Pt. Arena). The season and depths which result from the various OY alternatives and catch-sharing options range from the most restrictive in Alternative 1, to the most liberal in Alternative 6. The diagrams below (Figures 2-25 through 2-30) depict the season and depth structures for each of these six alternatives, and the corresponding estimates of impacts to each species is provided. *It is important to recognize that while six alternatives are described and depicted below, there are infinite number of season and depth structures that could result between the range of*

Alternative 1 and Alternative 6. CDFG has selected to analyze the most likely of the possibilities within the range.

The Council has determined it will establish a coastwide OY for yelloweye rockfish, the most constraining of the overfished species, within a range of 13 and 17 mt. For California's recreational fishery, yelloweye impacts will limit seasons and depths in the Northern and North-Central North of Point Arena Management Areas. However, in the Morro Bay South-Central Management Area, Monterey South-Central Management Area and North-Central South of Pt. Arena Management Areas, canary and blue rockfish are the most constraining species. In the Southern Management Area, cowcod and bocaccio are the most constraining species.

In addition to the yelloweye OY, the Council must determine the yelloweye catch sharing arrangement for 2009-10, the result of which will determine the harvest guideline (HG) for California's recreational fishery. Based on past catch sharing arrangements, and considering the range of OY alternatives, CDFG has determined that the yelloweye HG for the state's recreational fishery will fall within a range of 1.1 mt to 2.8 mt.

Because it is anticipated that the 2008 catch sharing arrangements will remain in effect for the other overfished species, CDFG has modeled its season and depth structures using a HG which would result for California's recreational fishery from both the most restrictive OY alternative available to the Council as identified in Table 2-1a, and other alternatives that are identified in Table 2-1a. For example, the OY alternatives under consideration for canary rockfish range from 35 mt to 155 mt. At present, the OY is 44 mt, and California's recreational HG is 9 mt. Using the lowest OY alternative of 35 mt, California's recreational HG would be 5.5 mt. Using the preliminary preferred OY of 105 mt, California's recreational HG would be 21.5 mt. These HG values were used in formulating the season and depth structures presented in the six alternatives.

For bocaccio and widow rockfish, only the lowest OY alternative is shown among the six California season and depth alternatives because constraints from other species (primarily yelloweye and cowcod) would prevent any further relaxation of seasons or depths.

In all management areas, under California laws, divers and shore-based anglers would continue to be exempt from the seasonal closures and depth restrictions. Additionally, California would continue to provide an exemption to allow year-round fishing for leopard sharks in specified enclosed bays and estuaries. California would also continue to provide for retention and possession of sanddabs and "other flatfishes" during the seasonal and depth closures that generally apply to all federal groundfish. The state would also continue with the prohibition on recreational groundfish fishing inside 10 fathoms at the Farallon Islands.

Alternative 1: The season structure depicted below would result from the most constraining optimum yields (OYs) under consideration by the Council, as follows: a 13 mt OY for yelloweye rockfish (using the 2007 catch sharing ratio which would produce the most restrictive 1.1 mt California rec HG), a 230 mt OY for blue rockfish, a 35 mt OY for canary rockfish, a 371 mt OY for widow rockfish, a 218 mt OY for boccacio, and a 2 mt OY for cowcod.

<table>
<tr><th>Management Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North</td><td colspan="4">CLOSED</td><td colspan="2">Open <20 fm</td><td colspan="6">CLOSED</td></tr>
<tr><td>North-Central N. of Pt. Arena</td><td colspan="5">CLOSED</td><td>Open <20 fm</td><td colspan="6">CLOSED</td></tr>
<tr><td>North-Central S. of Pt. Arena</td><td colspan="5">CLOSED</td><td colspan="3">Open <20 fm</td><td colspan="4">CLOSED</td></tr>
<tr><td>Monterey South-Central</td><td colspan="4">CLOSED</td><td colspan="6">Open <40 fm</td><td colspan="2">CLOSED</td></tr>
<tr><td>Morro Bay South-Central</td><td colspan="4">CLOSED</td><td colspan="6">Open <40 fm</td><td colspan="2">CLOSED</td></tr>
<tr><td>South</td><td colspan="2">CLOSED</td><td colspan="10">Open <50 fm</td></tr>
</table>

Figure 2-25. Alternative 1 (most restrictive) California Recreational Groundfish Season Structure By Marine Management Area for 2009-2010.

Alternative 1 Impacts: If the season structure above were selected, the following catches are estimated by the California recreational model:

Species	**Projected Catch (mt)**
Yelloweye Rockfish	0.5
Canary Rockfish	4.9
Bocaccio	42.8
Cowcod	0.1
Widow Rockfish	3.7
Blue Rockfish	127.9

Alternative 2: The season structure depicted below results from the following constraints: a 14 mt OY for yelloweye rockfish (allowing for a 1.2 mt California rec HG), a 230 mt OY for blue rockfish, a 105 mt OY for canary rockfish, a 371 mt OY for widow rockfish, a 218 mt OY for boccacio, and a 3 mt OY for cowcod.

<table>
<tr><th>Management Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North</td><td colspan="4">CLOSED</td><td colspan="3">Open <20 fm</td><td colspan="5">CLOSED</td></tr>
<tr><td>North-Central N. of Pt. Arena</td><td colspan="5">CLOSED</td><td>Open <20 fm</td><td colspan="6">CLOSED</td></tr>
<tr><td>North-Central S. of Pt. Arena</td><td colspan="5">CLOSED</td><td colspan="4">Open <30 fm</td><td colspan="3">CLOSED</td></tr>
<tr><td>Monterey South-Central</td><td colspan="4">CLOSED</td><td colspan="6">Open <40 fm</td><td colspan="2">CLOSED</td></tr>
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<tr><td>South</td><td colspan="2">CLOSED</td><td colspan="10">Open <60 fm</td></tr>
</table>

Figure 2-26. Alternative 2 California Recreational Groundfish Season Structure By Marine Management Area for 2009-2010.

Alternative 2 Impacts: If the season structure above were selected, the following catches are estimated by the California recreational model:

Species	Projected Catch (mt)
Yelloweye Rockfish	1.1
Canary Rockfish	6.8
Bocaccio	49.5
Cowcod	0.1
Widow Rockfish	6.0
Blue Rockfish	162.5

<u>Alternative 3:</u> The season structure depicted below results from the following constraints: a 17 mt OY for yelloweye rockfish (allowing for a 1.7 mt California rec HG), a 230 mt OY for blue rockfish, a 105 mt OY for canary rockfish, a 371 mt OY for widow rockfish, a 218 mt OY for boccacio, and a 3 mt OY for cowcod.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED					Open <20 fm			CLOSED			
North-Central N. of Pt. Arena	CLOSED					Open <20 fm July 15	CLOSED					
North-Central S. of Pt. Arena	CLOSED					Open <30 fm				CLOSED		
Monterey South-Central	CLOSED				Open <40 fm						CLOSED	
Morro Bay South-Central	CLOSED				Open <40 fm						CLOSED	
South	CLOSED		Open <60 fm									

Figure 2-27. Alternative 3 California Recreational Groundfish Season Structure By Marine Management Area for 2009-2010.

Alternative 3 Impacts: If the season structure above were selected, the following catches are estimated by the California recreational model:

Species	Projected Catch (mt)
Yelloweye Rockfish	1.6
Canary Rockfish	6.9
Bocaccio	49.2
Cowcod	0.1
Widow Rockfish	5.8
Blue Rockfish	156.1

<u>Alternative 4:</u> The season structure depicted below results from the following constraints: a 17 mt OY for yelloweye rockfish (allowing for a 1.8 mt California rec HG), a 230 mt OY for blue rockfish, a 105 mt OY for canary rockfish, a 371 mt OY for widow rockfish, a 218 mt OY for boccacio, and a 3 mt OY for cowcod.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED				Open <20 fm				CLOSED			
North-Central N. of Pt. Arena	CLOSED					Open <20 fm July 15		CLOSED				
North-Central S. of Pt. Arena	CLOSED					Open <30 fm				CLOSED		
Monterey South-Central	CLOSED				Open <40 fm						CLOSED	
Morro Bay South-Central	CLOSED				Open <40 fm						CLOSED	
South	CLOSED		Open <60 fm									

Figure 2-28. Alternative 4 California Recreational Groundfish Season Structure By Marine Management Area for 2009-2010.

Alternative 4 Impacts: If the season structure above were selected, the following catches are estimated by the California recreational model:

Species	Projected Catch (mt)
Yelloweye Rockfish	1.7
Canary Rockfish	7.0
Bocaccio	49.2
Cowcod	0.1
Widow Rockfish	5.8
Blue Rockfish	157.0

<u>Alternative 5:</u> The season structure depicted below results from the following constraints: a 17 mt OY for yelloweye rockfish (allowing for a 2.1 mt California rec HG), a 230 mt OY for blue rockfish, a 105 mt OY for canary rockfish, a 371 mt OY for widow rockfish, a 218 mt OY for boccacio, and a 3 mt OY for cowcod.

Management Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
North	CLOSED				Open <20 fm, May to Sept 15					CLOSED		
North-Central N. of Pt. Arena	CLOSED					Open <20 fm		CLOSED				
North-Central S. of Pt. Arena	CLOSED					Open <30 fm				CLOSED		
Monterey South-Central	CLOSED				Open <40 fm						CLOSED	
Morro Bay South-Central	CLOSED				Open <40 fm						CLOSED	
South	CLOSED		Open <60 fm									

Figure 2-29. Alternative 5 California Recreational Groundfish Season Structure By Marine Management Area for 2009-2010.

Alternative 5 Impacts: If the season structure above were selected, the following catches are estimated by the California recreational model:

Species	Projected Catch (mt)
Yelloweye Rockfish	2.0
Canary Rockfish	7.2

Bocaccio	49.2
Cowcod	0.1
Widow Rockfish	5.8
Blue Rockfish	159.1

<u>Alternative 6:</u> The season structure depicted below results from the following constraints: a 17 mt OY for yelloweye rockfish (allowing for a 2.8 mt California rec HG), a 230 mt OY for blue rockfish, a 105 mt OY for canary rockfish, a 371 mt OY for widow rockfish, a 218 mt OY for boccacio, and a 3 mt OY for cowcod.

<table>
<tr><th>Management Area</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North</td><td colspan="4">CLOSED</td><td colspan="4">Open <20 fm</td><td colspan="4">CLOSED</td></tr>
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<tr><td>Morro Bay South-Central</td><td colspan="4">CLOSED</td><td colspan="7">Open <40 fm</td><td>CLOSED</td></tr>
<tr><td>South</td><td colspan="2">CLOSED</td><td colspan="10">Open <60 fm</td></tr>
</table>

Figure 2-29. Alternative 5 California Recreational Groundfish Season Structure By Marine Management Area for 2009-2010.

Alternative 6 Impacts: If the season structure above were selected, the following catches are estimated by the California recreational model:

Species	**Projected Catch (mt)**
Yelloweye Rockfish	2.7
Canary Rockfish	7.8
Bocaccio	49.5
Cowcod	0.1
Widow Rockfish	6.0
Blue Rockfish	164.0

<u>Regional Impact Tables:</u> Estimated impacts to select groundfish species under each of the six options above, and for each recreational Groundfish Management Area, are provided in <u>Appendix A</u> at the end of this document. These values would allow for calculation of impacts to these species when evaluating hybrids options within the range of alternatives 1 though 6 above.

<u>Impact Table Implications</u>

As described by Alternatives 1 through 6 above, recreational fishing opportunity off California will clearly be restricted significantly in 2009-10 from prior recent years, based largely on the need to minimize yelloweye impacts. However, the constraining species for the California recreational fishery in 2008 and earlier years has been canary rockfish, and cowcod in southern California. Prior to that time period, bocaccio has been the most constraining species.

Because all of these species live in approximately the same depths, constraints on one species results in constrains or underutilization of other species, following principles of weak stock management. Because the 2009-10 alternatives are so restrictive, they cannot show what season and depth structures might be possible without the constraints needed for yelloweye.

OY levels for canary and bocaccio are likely to increase in 2009-10, however, in the California recreational fishery, there is not likely to be any additional take of these species against these OY and the state's recreational harvest guideline since the season must be severely restricted for yelloweye. This is an important consideration for future management development beyond 2009-10. For example, the fact that California's sport fishery did not take any additional canary in the 2009-10 seasons should not have bearing upon any decisions relative to scorecards should a canary scorecard be needed again at some time in the future.

Bag Limits, Size Limit, and Other Management Measure Alternatives or Modifications Considered for Use in California's Recreational Fishery in 2009-2010

The following bag limits, size limits, and other management measure alternatives are considered for the 2009-10 California recreational groundfish fishery:

- a 6-fish Rockfish Cabezon and Greenling (RCG) bag limit in the North and North-Central North of Pt. Arena Management Areas and 10 fish bag limit in the remainder of the state with a 1 fish sublimit for cabezon, and a 2 fish sublimit for greenlings statewide.
- increase the bag limit for cabezon from 1 to 2 fish in some management areas.
- increase the bag limit for bocaccio from 1 to 2 fish in some management areas south of 40°10' N latitude.
- increase the bag limit for kelp greenling from 1 to 2 fish in some management areas.
- eliminate gear restrictions for sanddabs and other flatfishes.
- include petrale sole in the group of sanddabs and other flatfish allowed during season closures.
- reduce the size limit for lingcod north of Pt. Arena to 22 inches.
- modify existing bag limits and bag compositions to better allow for take of unconstrained species and improve avoidance of constraining species

2009-10 Area Restriction Alternatives (YRCAs)

CDFG has evaluated four potential Yelloweye Rockfish Conservation Areas (YRCAs) which include habitat in both state and Federal waters where high yelloweye encounter rates have been documented. If implemented, YRCAs are anticipated to reduce yelloweye impacts during the open fishing seasons in both the Northern Groundfish Management Area and the North-Central North of Pt. Arena Groundfish Management Area, possibly allowing for a longer fishing season.

The four areas identified for possible use in the 2009-2010 seasons are in the general area of Point St. George, South Reef, Reading Rock, and Point Delgada. The proposed boundaries for these areas are depicted in Figures 2-31 to 2-33, and the latitude and longitude coordinates would be specified as follows:

Point St. George
41˚ 51.00' N. lat.; 124˚ 23.75' W. long.
41˚ 51.00' N. lat.; 124˚ 20.75' W. long.
41˚ 48.00' N. lat.; 124˚ 20.75' W. long.
41˚ 48.00' N. lat.; 124˚ 23.75' W. long.

South Reef
41˚ 42.20' N. lat.; 124˚ 16.00' W. long.
41˚ 42.20' N. lat.; 124˚ 13.80' W. long.
41˚ 40.50' N. lat.; 124˚ 13.80' W. long.
41˚ 40.50' N. lat.; 124˚ 16.00' W. long.

Reading Rock
41˚ 21.50' N. lat.; 124˚ 12.00' W. long.
41˚ 21.50' N. lat.; 124˚ 10.00' W. long.
41˚ 20.00' N. lat.; 124˚ 10.00' W. long.
41˚ 20.00' N. lat.; 124˚ 12.00' W. long.

Point Delgada
(Northern Quadrant)
39˚ 59.00' N. lat.; 124˚ 5.00' W. long.
39˚ 59.00' N. lat.; 124˚ 3.00' W. long.
39˚ 57.00' N. lat.; 124˚ 3.00' W. long.
39˚ 57.00' N. lat.; 124˚ 5.00' W. long.
(Southern Quadrant)
39˚ 57.00' N. lat.; 124˚ 5.00' W. long.
39˚ 57.00' N. lat.; 124˚ 2.00' W. long.
39˚ 54.00' N. lat.; 124˚ 2.00' W. long.
39˚ 54.00' N. lat.; 124˚ 5.00' W. long.

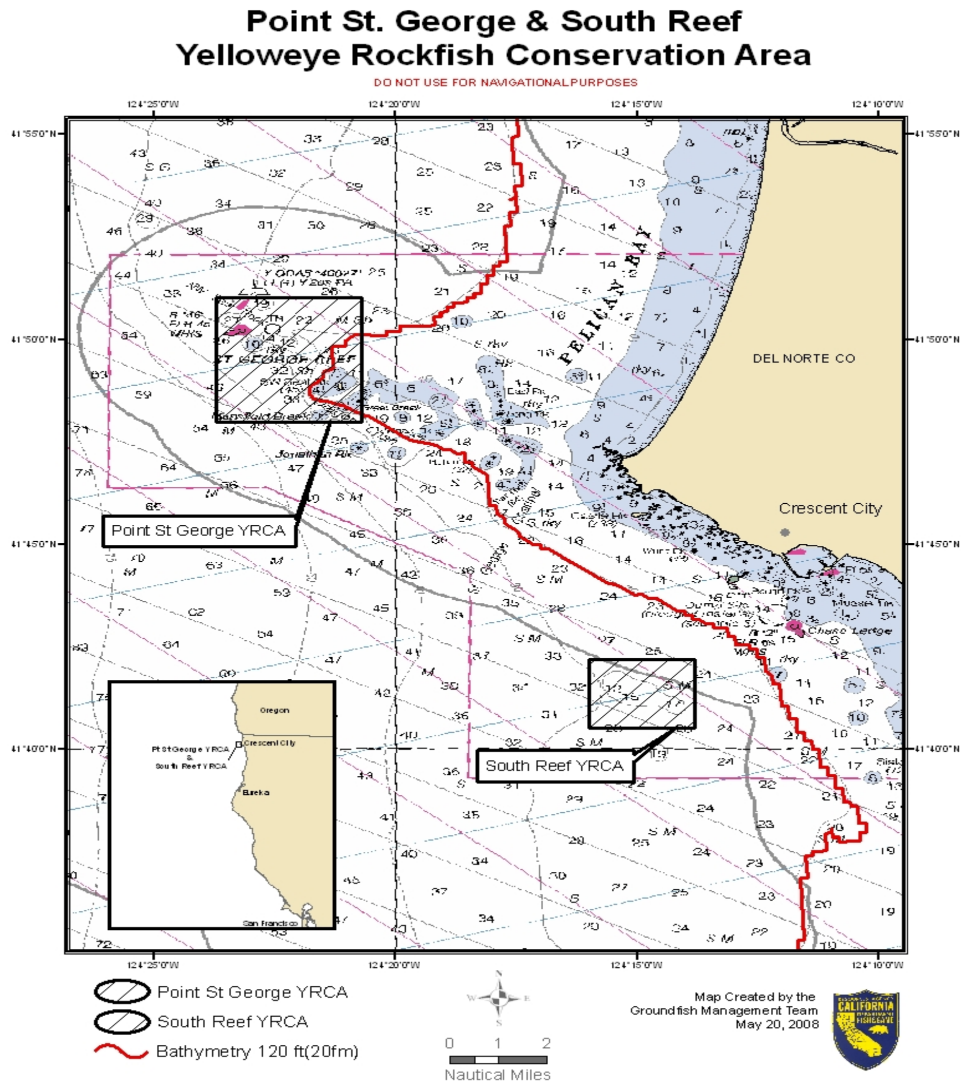


Figure 2-31. The proposed Pt. George and South Reef Yelloweye Rockfish Conservation Area proposed by CDFG for 2009-10.

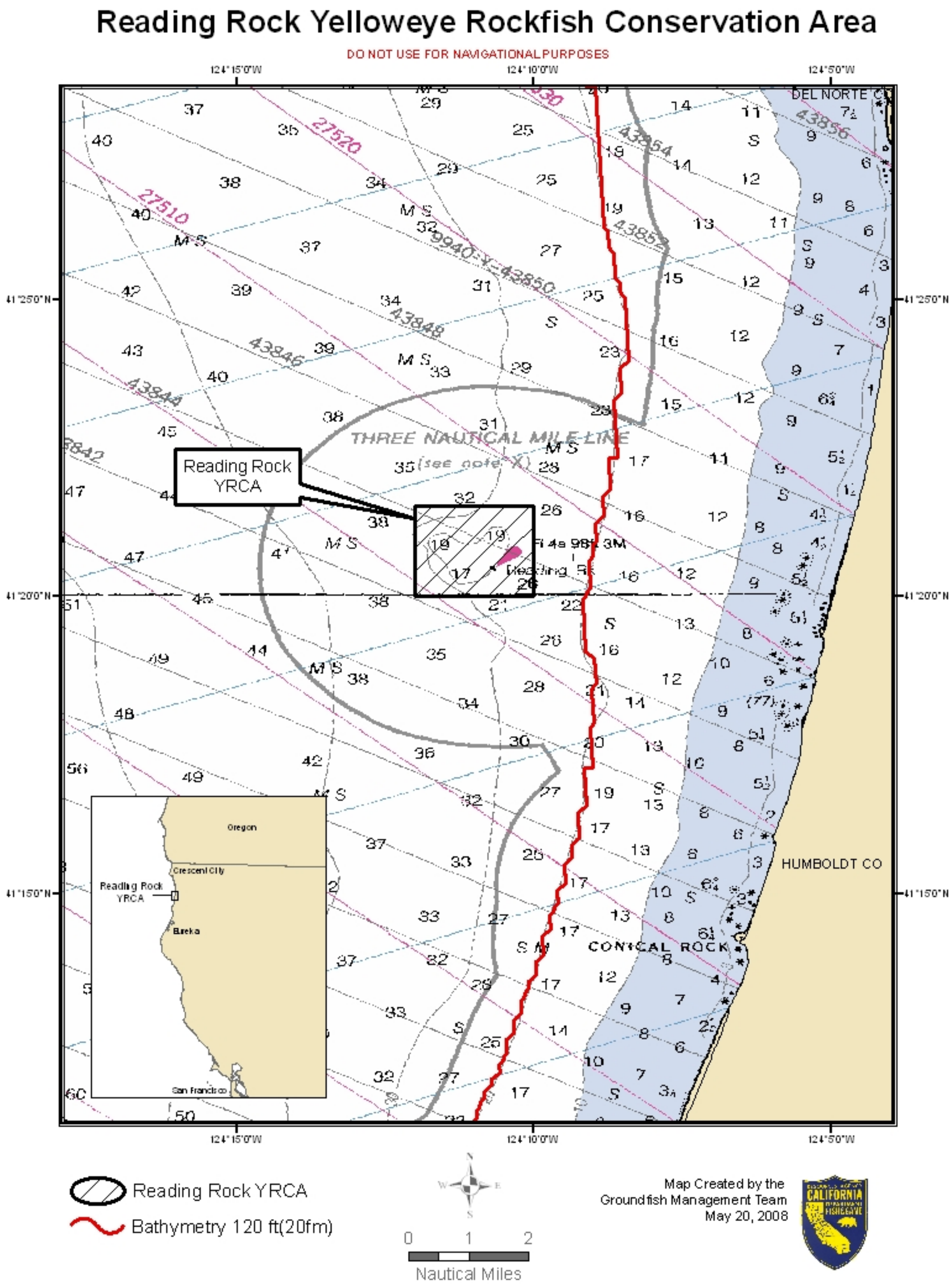


Figure 2-32. The proposed Reading Rock Yelloweye Rockfish Conservation Area proposed by CDFG for 2009-10.

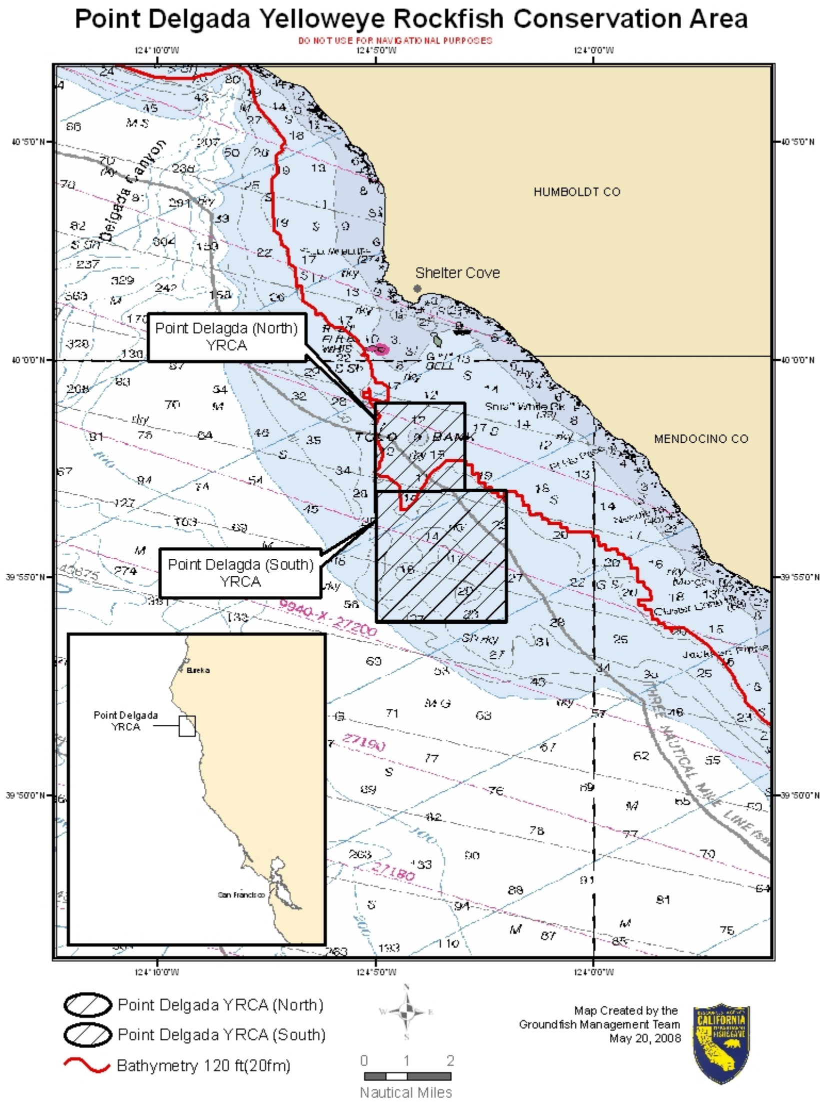


Figure 2-32. The proposed Point Delgada (north and south) Yelloweye Rockfish Conservation Area proposed by CDFG for 2009-10.

Revisions to Section 4.5.1.9

Methodology Used to Project Recreational Catches for 2009–10

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 2007–08, with revision to the proportion of catch by depth for yelloweye rockfish, percent of catch by month for yelloweye and canary rockfish, division of the North-Central management area into two areas, and use of depth-dependent mortality rates for rockfish of the genus *Sebastes*. The 2005-2007 data from the California Recreational Fishery Survey (CRFS) program serves as a baseline. The model output predicts expected catch under any combination of season and depth fishing restrictions for each of the regions described below:

- Northern Groundfish Management Area: North of 40°10' N latitude to CA/OR border
- North-Central North of Pt. Arena Groundfish Management Area: South of 40°10' N latitude to 38°57' N. latitude (Pt. Arena)
- North-Central South of Pt. Arena Groundfish Management Area: South of Pt. Arena to 37°11' N latitude (Pigeon Pt.)
- South-Central Monterey Groundfish Management Area: South of Pigeon Pt. to 36° N latitude (Lopez Pt.)
- South-Central Morro Bay Groundfish Management Area: South of Lopez Pt. to 34°27' N latitude (Pt. Conception)
- South Groundfish Management Area: South of Pt. Conception to CA/Mexico Border

CDFG/California Recreational Groundfish (RecFish) Model Assumptions

Effort Shift Inshore: The model includes a 27.6 percent increase in expected catches when fishing is restricted to less than 30 fm and a 39.3 percent 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: The GMT developed depth-dependent mortality rates for discarded rockfish of the genus *Sebastes* in 10-fm increments, the derivation of which is described in section 4.1.5.6. The species-specific depth-dependent mortality rates agreed upon by the GMT and approved by the PFMC in 2008 are applied to the discarded fish in the CRFS base data from 2005-07 used in the RecFish model. When projecting the 2009-2010 season catch, discard catch estimates are multiplied by the proportion of catch in a given 10-fm depth increment times the depth-dependent mortality rate for the corresponding depth for each species.

Inputs and Key Parameters for the Model

Weighting of Base Years: Base year data 2005-2007 were given nearly equal weighting by applying a 0.99 decay function. The previous biennial cycle made use of a 0.67 decay function to weight 2005 more heavily than 2004. With the exclusion of the 2004 data in the current model due to issues with the comparability of trip types between years, there are three years of data available for the model and these are weighted nearly equally (2007 = 33.7%, 2006 = 33.3%, 2005 = 33.0%) to represent the base catch in the model.

Base Year Catch: Initially, CRFS catch estimates in weight of fish were summed for caught and retained (CRFS “A” catch), filleted/caught otherwise unavailable (“B1” catch), and for species of concern, a proportion of CRFS reported discarded fish 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 obtain an estimate for what the catch would have been if all months and all depths had been open. This back calculation uses month and depth catch proportions derived from historical catch estimates from seasons unregulated by month and depth.

Historical Catch By Month: Estimates of historical percent catch by two-month period were calculated for each region based on Marine Recreational Fisheries Statistics Survey (MRFSS) data (weight of A+B1) from 1993-99, 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. This percentage was adjusted for yelloweye and canary rockfish in order to reflect the apparent opener effect in recent years, which resulted in increased catch in the months following the season opening and reduced effort later in the year as compared to the historical data. For these two species, the average proportion of catch by month for 2005 and 2006 were used to perform a post-model adjustment to apportion the projected catch for the year to the given months of the season.

Historical Catch by Depth: Estimates of percent catch by depth were calculated for each region based on 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.

To improve the accuracy of catch estimates for yelloweye rockfish, two methods were employed when modeling the effect of depth restrictions on the catch of this species:

1) For expanding baseline input catch data from regulated seasons to all depths, unregulated depth distribution of catch data from other areas can be used to supplement the existing historical data; these data must be from unregulated years to be able to expand to all depths. In the North, data from 1999-2003 were used (years unregulated by depth in the North), recent unregulated Oregon catch by depth (1999-2003), and 1999-2000 data from the North-Central area that is north of Point Arena (for bathymetric and fishing effort similarities to the North). For the North-Central area, additional data from dockside party charter catch by depth data from 1999-2000 were used.

2) More recent catch data from CRFS were used to produce region–specific proportions of catch by depth with a higher sample size than historical data to provide improved projections that represent the current depth distribution of catch. Although this data is from regulated years, recent years have seen a consistent regulatory scheme by depth that would allow for use in apportioning catch by depth within the open depth strata. For example, for the North, the years 2004-2007 saw a consistent 0-30 fm depth restriction in place. The catch by depth for those years was used to project the depth distribution within the upper 30 fm for upcoming years (assuming catch will be restricted to within this zone), providing a more current framework than using the historical 1999-2000 data. Similarly, this applies to 2006-2007 catch by depth data for the North-Central Regions (same 0-30 fm depth restrictions). These depth distributions

are applied as a post-model run adjustment, reapportioning the projections with the new depth distributions.

Determining the Proportion of Angler Reported Unavailable Dead Catch for Yelloweye and Canary Rockfish that was Composed of Discarded Dead Fish:

The California Recreational Fisheries Survey program (CRFS) uses several different catch types in generating catch estimates: sampler examined catch ("A"), angler reported unavailable catch including discarded dead ("B1"), and angler reported discarded live catch ("B2"). The B1 category includes disposition such as retained (filleted fish, fish given away, used for bait or otherwise unavailable) and fish discarded dead. Unfortunately, since CRFS began in 2004, no disposition of the B1 catch has been recorded for the majority of private and rental trips which are sampled in the PR1 mode. Therefore, it is not possible to separate the discarded dead fish from the retained unavailable fish in the B1 catch type without use of a proxy for the proportion of fish discarded dead. Attempts have been made to use sparse available data and apply these to the B1 catch data, but little data exists for overfished non-retention species, such as yelloweye and canary rockfish.

To estimate the proportion of B1 catch of yelloweye and canary rockfish that is discarded dead, a "compliance factor" (CF) was determined from recent (2005-2007) CRFS data. The CF is calculated by dividing the B2 catch by the total catch (A+B1+B2); this represents the proportion of fish reported discarded live by anglers (reported live only) while complying with regulations. It is conservative, as a portion of the B1 catch (the discarded dead) in the denominator should be in the numerator. The CF is used as a proxy for the proportion of B1 that is discarded dead, and so it is multiplied by the B1 catch to estimate the total fish discarded dead. This amount is added to the known B2 catch to arrive at total discards. This value is then multiplied by discard mortality factors by depth to obtain the discard mortality. Total mortality is then the retained catch (A+B1, less the proportion of B1 designated discarded dead) + discard mortality. Because the CFs are conservative, the proportions of B1 that are considered otherwise unavailable dead (filleted, used for bait, given away) will be biased high, thereby leading to an estimate of total mortality that is biased high. CFs were determined for each management area for both yelloweye and canary rockfish and applied to the B1 (aggregate unavailable dead catch) catch for these species to provide a conservative proxy estimate of fish discarded dead to which depth dependent mortality rates would be applied in estimating total mortality.

Methodology Used to Calculate Annual Unrestricted Catch

1. Pull (A+B1+B2+B3) 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 percents 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. 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 percent catch for the year that these regulated months represent (from the wave percents 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 RecFish 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.

Projecting Catch from Model Runs

The RecFish model output consists of a matrix for each species or species group and management area. Within each matrix, catch tonnages are generated for each month and 10-fm depth stratum. Following a model run for all months and depths open (with a 0.99 decay value selected), the resulting catch projection values matrix is adjusted by separating out the retained (A+B1) and discarded (B2+B3) catch. The discard tonnages are obtained using 05-07 average discard proportions for each species and multiplying these by the total tonnages obtained from the model. These discard tonnages are multiplied by mortality factors condensed from: 1) GMT-determined mortality rates by depth, and 2) CRFS depth distributions from seasons with identical depth restrictions to expected future seasons. The resulting discard mortality is then recombined with retained catch to obtain total projected mortality. This final matrix is used as a base to project catch by summing catch from selected months and depths open, while also factoring any effort shift effects. In addition, for yelloweye and canary rockfish there are other post-model adjustments for catch by time and depth (see “Inputs and Key Parameters for Model” above).

Subdivision of the North-Central Management Area

Ports south of Point Arena contributed only 2% of the statewide catch of yelloweye rockfish in 2007. In order to prevent the area south of Point Arena from being unnecessarily closed inseason, the North-Central Management Area will be divided into two management areas, the North-Central North of Point Arena Management Area and North-Central South of Point Arena Management Area. Adoption of this line will divide the current North-Central Management Area into two smaller areas.

Depth Restriction Changes

The 20-fm depth restriction will continue in the Northern and North-Central North of Point Arena Management Areas to reduce impacts on yelloweye rockfish. The shallower depth restriction is projected to result in a 33.8% reduction in yelloweye rockfish catch in the North-Central North of Point Arena and a 26.8% reduction in the North Central South of Point Arena. To reduce impacts on Minor Nearshore Rockfish in the North-Central South of Point Arena Management Area, the depth restriction may be increased to 30 fm.

Yelloweye Rockfish Conservation Areas Proposed for 2009-2010

CDFG used 1999-2007 MRFSS/CRFS effort data and CRFS 2006 and 2007 yelloweye catch data (both sampler examined and reported) with latitude and longitude of catch data to identify one square nautical mile blocks in state and federal waters off northern California with high yelloweye rockfish catch per unit effort using Arc View 9.1.

Many areas in the North and North-Central Management Area North of Point Arena that have high yelloweye catch were identified. Three criteria were used in identifying areas for further analysis of potential catch savings from YRCAs:

- High yelloweye catch per unit effort within the block.
- Clustering of high catch per unit effort blocks in the same area.

- Repeated presence of high catch per unit effort among years.

The following sections discuss the catch savings estimation methods and areas identified as prospective YRCAs for select areas that include both state and federal waters.

The 2009-2010 EIS development provided the opportunity to identify areas since the analysis could be included in the FEIS and be available for use in the 2009-2010 seasons. The catch savings which potentially could result from the YRCAs were calculated as:

> Percent Catch Reduction from YRCA Implementation = ((sampled yelloweye catch for the remaining ports in the management area + ((sampled yelloweye catch for the port * (1-the proportion of sampled yelloweye catch within the YRCA) * (1 + the proportion of effort with rockfish in the catch within the YRCA))) / sampled yelloweye catch for the management area.)*100.

Table 4-CAYRCA. Estimated percent yelloweye catch reduction from the implementation of YRCAs and combinations of YRCAs.

Yelloweye Rockfish Conservation Area	Management Area	Port of Origin	Percent Reduction in Management Area Yelloweye Catch
Point Saint George	Northern	Crescent City	8%
South Reef	Northern	Crescent City	6%
Redding Rock	Northern	Trinidad	30%
Point Delgada North	North-Central North of Pt. Arena	Shelter Cove	6%
Point Delgada South	North-Central North of Pt. Arena	Shelter Cove	32%
Point Saint George and South Reef	North-Central North of Pt. Arena	Crescent City	17%
Point Delgada North and South	North-Central North of Pt. Arena	Shelter Cove	49%
All Northern Management Area YRCAs	Northern	Crescent City / Trinidad	47%
All North-Central North of Pt. Arena Management Area YRCAs	North-Central North of Pt. Arena	Shelter Cove	49%

Should any of the YRCAs be implanted to reduce impacts to yelloweye, the percentages of anticipated catch savings above may be used to provide additional fishing time (i.e. longer seasons) in the two northernmost management areas.

It is important to note that the statistical calculations above rely on the premise that recreational anglers will not mitigate for the new closure areas; i.e. that effort shift will not occur into the remaining open areas, or alternatively, the additional angling pressure in the remaining open areas will not result in any yelloweye catch.

While the proposed YRCAs show promise in terms of protecting hotspot areas where significant yelloweye impacts have been demonstrated in the past, because of the uncertainty involved in catch savings, the numbers above should be used conservatively when evaluating potential fishing season durations. The amount of additional fishing time that YRCAs might allow for would require consideration of other factors, such as the months selected as the open season and the number selected as the CA recreational yelloweye harvest guideline. Also, recreational groundfish fishing seasons have traditionally been defined in terms of months or half-months. Therefore, when converting yelloweye savings from YRCAs into additional time on the water, the selection of specific season dates becomes more important and could add administrative complexity if the time periods considered involve numbers of days or weeks rather than months.

The latitudes and longitudes that delineate the proposed YRCAs for possible use in the 2009-10 seasons are provided in the California Recreational portion of section 2.2.4.2.

Analyzing the Effectiveness of the Sanddabs and Other Flatfish Gear Restriction Regulation

Sanddabs and Other Flatfish are allowed to be taken in the California recreational fishery when fishing for rockfish, lingcod and associated species (referred to as the RCG complex below for simplicity) are closed, and also may be taken in depths which comprise the recreational RCA. Starting in 2004 the following regulations were placed on sanddabs and other flatfish to reduce bycatch of overfished species:

> *The use of weight no more than 2 pounds and no more than 12 hooks size 2 or less while fishing for sanddabs and Other Flatfish during the months in which the RCG complex is closed.*

CDFG proposes to eliminate this requirement as it has shown it does not offer additional protection to overfished rockfish. Additionally, both CRFS samplers and party boat operators indicate that bycatch of rockfish while fishing for sanddabs and other flatfish is minimal.

Comparing the bycatch of rockfish in years when there were no gear restrictions to years when the restrictions were put in place shows that the regulations have not served to reduce the take or interaction with overfished species. Four rockfish species of concern were analyzed: bocaccio, canary rockfish, cowcod, and yelloweye rockfish. As bycatch levels are unchanged from years when there were no restrictions, the gear restrictions may be unnecessary and could potentially be eliminated, simplifying the ocean sport fish regulations.

Using the CRFS database for 2004-07 and the MRFSS database for 2001-03, relevant data were extracted pertaining to all catch events in which sanddab species group was targeted. All species that were caught in association with sanddab as a targeted species group during the months in which rockfish were closed were queried for 2004 through 2007. Data were stratified into the northern California (Oregon/California border to Point Conception) and southern California (Point Conception to the U.S.-Mexico border) areas. Data were further stratified by party/charter boats (PC) and private/rental boats (PR). The same data extraction and query was made using the MRFSS data base for 2001 through 2003. A comparison of the bycatch was made between the seasons with no gear restrictions (2001-03) and the seasons when the restrictions were in place (2004-07). It was assumed that anglers were using the required gear when fishing for sanddabs.

Table 4-CArecSD shows that before the sanddab gear restrictions were in place, there was little to no catch association of species of concern when sanddabs were the targeted species. The results for the bycatch of species of concern during the time when the gear restrictions were in place also showed little to no catch of those species. The results suggest that sanddabs and Other Flatfish fishery gear restrictions have not been effective in restricting the bycatch of the rockfish species of concern, and thus could be eliminated.

Table 4-CArecSD. Numbers of fish and ratios of rockfish species of concern to sanddabs before and after gear restriction regulations.

Year	Prior to Gear Restrictions								
	Numbers of Fish Sampled					Bycatch Ratio to Sampled Sanddabs			
	Sanddabs	Bocaccio	Canary	Cowcod	Yelloweye	Bocaccio	Canary	Cowcod	Yelloweye
Northern California PC Boats									
2001	No data	NA	NA	NA	NA	NA	NA	NA	NA
2002	1,657	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	2,984	0	0	0	0	0.0000	0.0000	0.0000	0.0000
Northern California PR Boats									
2001	210	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2002	324	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	220	0	0	0	0	0.0000	0.0000	0.0000	0.0000
Southern California PC Boats									
2001	309	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2002	2,528	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	1,743	0	0	0	0	0.0000	0.0000	0.0000	0.0000
Southern California PR Boats									
2001	42	1	0	0	0	0.0238	0.0000	0.0000	0.0000
2002	494	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2003	740	0	0	0	0	0.0000	0.0000	0.0000	0.0000

Year	After Gear Restriction Regulations								
	Numbers of Fish Sampled					Bycatch Ratio to Sampled Sanddabs			
	Sanddabs	Bocaccio	Canary	Cowcod	Yelloweye	Bocaccio	Canary	Cowcod	Yelloweye
Northern California PC Boats									
2004	4,183	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2005	967	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2006	1,383	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2007	575	0	1	0	0	0.0000	0.0017	0.0000	0.0000
Northern California PR Boats									
2004	2,837	0	0	0	2	0.0000	0.0000	0.0000	0.0007
2005	952	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2006	963	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2007	1,037	0	3	0	0	0.0000	0.0029	0.0000	0.0000
Southern California PC Boats									
2004	2,522	5	0	0	0	0.0020	0.0000	0.0000	0.0000
2005	3,175	1	0	0	0	0.0003	0.0000	0.0000	0.0000
2006	900	0	0	0	0	0.0000	0.0000	0.0000	0.0000
2007	3,439	2	0	0	0	0.0006	0.0000	0.0000	0.0000
Southern California PR Boats									
2004	598	1	0	0	0	0.0017	0.0000	0.0000	0.0000
2005	676	2	0	0	0	0.0030	0.0000	0.0000	0.0000
2006	1,351	1	0	0	0	0.0007	0.0000	0.0000	0.0000
2007	1,158	2	0	0	0	0.0017	0.0000	0.0000	0.0000

<u>Bag Limit Analyses</u>

Rockfish Cabezon and Greenling (RCG) Bag Limit

A six fish bag limit is being considered for Northern and North-Central North of Point Arena Management Area to reduce impacts on yelloweye rockfish. The RCG Bag Limit Reduction analysis was done using the Bag Frequency Analysis tool available on the RecFIN web site available at http://www.psmfc.org/recfin/forms/bfreq.html. The parameters selected in the analysis were based on past analysis of bag limit reduction by species. The species chosen were all rockfish, kelp greenling, cabezon with a 10 fish bag limit. The marine area selected was all areas shoreward of 3 nm. Three modes were analyzed separately: Party and Charter mode, Private and Rental mode, and Shore mode. In the Data type parameters, "split shared angler bags" was selected and the catch type was A+B1+B2: total catch. Counties selected were based on the counties within their respective Management Areas. The analysis looked at two areas, the Northern and North-Central Management Area North of Pt. Arena. The range of Hypothetical Bag Limits analyzed was 10 to 3 fish for RCG. The years used in the analysis were 2005-07.

Once the parameters were set, the analysis was conducted and the results were used to calculate total % catch reduction for a reduced bag limit. The total catch for each bag limit from 10 fish down to 3 fish were subtracted by the total catch of the current 10 fish bag limit regulation. The result was divided by the current 10 fish bag limit total catch number and multiplied by 100 to provide a percent reduction in catch resulting from a given bag limit. The resulting catch reductions for the private rental and party charter modes can be seen in Table 4-CARCGbag.

A six fish bag limit is estimated to result in a 20% reduction in the RCG catch for the private rental mode and a 26% catch reduction in the party charter mode in the Northern Management Area. The majority of the rockfish catch in California originates from the PR and the 20% catch reduction is used as the proxy for catch reduction for all modes in calculating the catch resulting from a 6 fish bag limit in the Northern Management Area and the North-Central Management Area North of Pt. Arena. This analysis accounts for only the catch reduction due to the reduction in retained fish by a given angler, it does not account for reductions in effort due to the reduced opportunity represented by the lower bag limit which could further reduce catch. This analysis does not account for the possibility of increased discarding with lowered bag limits as anglers become more selective with regard to the fish they retain.

Table 4-CARCGbag. Percent reductions in the RCG catch resulting from reductions in the bag limit from the current 10 fish bag limit for the Private Rental and Party Charter Modes in the Northern and North-Central Management Areas.

Bag Limit	Private and Rental Percent RCG Catch Reduction	Party Charter Percent RCG Catch Reduction
9	3%	5%
8	8%	11%
7	14%	18%

6	20%	26%
5	28%	35%
4	38%	45%
3	48%	56%

Bocaccio, Greenling, and Cabezon Bag Limit Analyses

Alternative 2009-10 bag limits include an increase in the greenling and cabezon bag limits from one to two fish. CDFG used the RECFIN methodology for Hypothetical Bag Limit Analyses to determine increased impacts on greenlings and cabezon resulting from this change. We used 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 greenlings and cabezon that B1 includes filets and there were no fish thrown back dead as kelp greenlings and cabezon usually survive release. B2 includes live fish over the bag limit or under the size limit of 12". ince 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. Results show a consistent increase in expected catch for the private/rental mode for both species, as well as increases in catch for cabezon shore modes (Table 4-CARCGbag2).

Conversely, an alternative bocaccio bag limit 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 to determine increased impacts on bocaccio resulting from this change. The program uses the A+B1+B2 fish from 2005-07 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. B2 fish were included as CDFG assumed most of the B2 fish were regulatory discards after the angler had already caught one bocaccio. All bags over the hypothetical limit are then set to the hypothetical limit to calculate increased take. The increased estimated impacts on bocaccio are strongly pronounced in the private/rental mode south of Pigeon Pt., especially in the Southern Management Area, and in the party/charter mode in the Southern Management Area (Table 4-CARCGbag2)

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.

Table4-CARCGbag2. Results of analyses of bag limit changes for bocaccio, greenlings, and cabezon.

Expected % increase in catch from 1 to 2-fish bag limit by fishing mode and management area

	Bocaccio		Greenlings		Cabezon			
	Fishing Mode							
Management Area	PC	PR	PC	PR	PC	PR	MM	BB
North	-	-	33	34	0	44	5	75
North-Central N of Pt Arena	0	0	0	47	0	20	14	0
North-Central S of Pt Arena	8	0	0	21	8	24	23	17
South-Central - Monterey	3	33	0	38	0	21	13	0
South-Central - Morro Bay	7	25	0	40	8	37	0	0
South	29	63	0	0	3	24	20	20

(PC = Party/Charter, PR = Private/Rental, MM = man-made structures, BB = beach/bank)

Proposed Reduction of the Lingcod Size Limit in Northern California

One measure under consideration for the 2009-10 groundfish management cycle involves a decrease in the lingcod recreational and commercial minimum size limit from 24 inches to 22 inches, consistent with the limit in Oregon and Washington. This measure is being considered to potentially help alleviate fishing pressure on yelloweye rockfish.

Analysis of yelloweye rockfish interactions show that, at least in the northern portion of the state, lingcod catch (harvested and released) is highly associated with yelloweye rockfish encounters. This has been especially true for the past two groundfish seasons. Lowering the recreational lingcod minimum size limit to 22 inches could get recreational anglers off the water sooner (by meeting their bag limit in less time), thus decreasing the amount of yelloweye rockfish encounters. For commercial fishermen, lower size limits may mean filling the trip limit more quickly. However, any anticipated savings are speculative and cannot be quantified.

Moreover, it is likely that drawbacks of the proposed change would outweigh any potential savings to yelloweye rockfish. Specifically, the lower size limit would add administrative complexity and potential enforcement difficulties within California, as the measure is not under consideration for southern California. It is also speculative to presume that a regulation change to lower the size limit would prompt a change in fishing behavior as it relates to yelloweye interactions. The size limit reduction would not require sport or commercial fishermen to stop fishing once a lingcod limit is reached. Fishermen may continue to fish for other groundfish species in the same areas, and would be allowed to do so by law.

Revisions to Section 4.5.4.9

4.5.4.9 California Recreational

The predicted total catches of important groundfish species by 2009-10 alternative California recreational management measures are shown in Table 4-CARecImp.

Appendix A

Table 4-CARecImp. Predicted total catch (mt) of important groundfish species by 2009-10 alternative management measures for the California recreational fishery.

Species	Marine Management Area	2009-10 California Recreational Alternatives					
		CA Rec. Alt 1	CA Rec. Alt 2	CA Rec. Alt 3	CA Rec. Alt 4	CA Rec. Alt 5	CA Rec. Alt 6
Canary	N	0.1	0.3	0.5	0.5	0.6	0.5
	NCN	0.0	0.1	0.3	0.3	0.4	0.9
	NCS	2.4	3.8	3.8	3.8	3.8	3.8
	SC - Mont	1.4	1.5	1.4	1.4	1.4	1.5
	SC - Morro	0.7	0.8	0.7	0.7	0.7	0.8
	S	0.3	0.3	0.3	0.3	0.3	0.3
	Total	4.9	6.8	6.9	7.0	7.2	7.8
Yelloweye	N	0.1	0.4	0.6	0.7	0.8	0.7
	NCN	0.1	0.2	0.4	0.4	0.6	1.4
	NCS	0.3	0.5	0.5	0.5	0.5	0.5
	SC - Mont	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.9	1.1	1.6	1.7	2.0	2.7
Black	N	16.2	52.5	58.9	74.3	80.4	74.3
	NCN	1.6	3.1	5.3	5.3	7.5	11.9
	NCS	27.6	31.2	31.2	31.2	31.2	31.2
	SC - Mont	6.2	6.5	6.2	6.2	6.2	6.5
	SC - Morro	2.8	2.9	2.8	2.8	2.8	2.9
	S	0.0	0.0	0.0	0.0	0.0	0.0
	Total	54.4	96.2	104.4	119.8	128.1	126.7
Bocaccio	N	-	-	-	-	-	-
	NCN	0.0	0.0	0.0	0.0	0.0	0.1
	NCS	2.0	3.1	3.1	3.1	3.1	3.1
	SC - Mont	2.9	3.0	2.9	2.9	2.9	3.0
	SC - Morro	3.4	3.5	3.4	3.4	3.4	3.5
	S	34.5	39.9	39.9	39.9	39.9	39.9
	Total	42.8	49.5	49.2	49.2	49.2	49.5
Cabezon	N	1.3	2.3	2.7	3.3	3.7	3.3
	NCN	0.7	0.7	1.3	1.3	1.9	3.0
	NCS	4.7	5.4	5.4	5.4	5.4	5.4
	SC - Mont	0.7	0.8	0.7	0.7	0.7	0.8
	SC - Morro	1.7	2.0	1.7	1.7	1.7	2.0
	S	7.6	7.6	7.6	7.6	7.6	7.6
	Total	16.7	18.8	19.4	20.0	20.9	22.1

Table 4-CARecImp. Predicted total catch (mt) of important groundfish species by 2009-10 alternative management measures for the California recreational fishery (continued).

Species	Mgt. Area	2009-10 California Recreational Alternatives					
		CA Rec. Alt 1	CA Rec. Alt 2	CA Rec. Alt 3	CA Rec. Alt 4	CA Rec. Alt 5	CA Rec. Alt 6
Cowcod	N	-	-	-	-	-	-
	NCN	0.0	0.0	0.0	0.0	0.0	0.0
	NCS	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Mont	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	0.1	0.1	0.1	0.1	0.1	0.1
	Total	0.1	0.1	0.1	0.1	0.1	0.1
Widow	N	0.0	0.0	0.0	0.0	0.0	0.0
	NCN	0.0	0.0	0.0	0.0	0.0	0.0
	NCS	0.3	0.7	0.7	0.7	0.7	0.7
	SC - Mont	2.3	2.5	2.3	2.3	2.3	2.5
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	1.1	2.8	2.8	2.8	2.8	2.8
	Total	3.7	6.0	5.8	5.8	5.8	6.0
Shallow NS	N	-	-	-	-	-	-
	NCN	0.5	0.9	1.5	1.5	2.1	3.3
	NCS	14.2	20.4	20.4	20.4	20.4	20.4
	SC - Mont	8.8	9.5	8.8	8.8	8.8	9.5
	SC - Morro	14.2	15.3	14.2	14.2	14.2	15.3
	S	8.5	8.6	8.6	8.6	8.6	8.6
	Total	46.2	54.7	53.5	53.5	54.1	53.8
Deeper NS	N	-	-	-	-	-	-
	NCN	2.0	3.9	6.8	6.8	9.7	15.5
	NCS	97.1	145.4	145.4	145.4	145.4	145.4
	SC - Mont	40.2	44.6	40.2	40.2	40.2	44.6
	SC - Morro	72.9	80.8	72.9	72.9	72.9	80.8
	S	53.1	53.4	53.4	53.4	53.4	53.4
	Total	265.3	328.0	318.7	318.7	321.6	324.1
Other Minor North Rockfish	N	1.2	8.3	9.4	11.8	14.1	9.4
	NCN	-	-	-	-	-	-
	NCS	-	-	-	-	-	-
	SC - Mont	-	-	-	-	-	-
	SC - Morro	-	-	-	-	-	-
	S	-	-	-	-	-	-
	Total						
CA Scorpionfish	N	-	-	-	-	-	-
	NCN	0.0	0.0	0.0	0.0	0.0	0.0
	NCS	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Mont	0.0	0.0	0.0	0.0	0.0	0.0
	SC - Morro	0.0	0.0	0.0	0.0	0.0	0.0
	S	43.4	43.5	43.5	43.5	43.5	43.5
	Total	43.4	43.5	43.5	43.5	43.5	43.5

Table 4-CARecImp. Predicted total catch (mt) of important groundfish species by 2009-10 alternative management measures for the California recreational fishery (continued).

Species	Mgt. Area	2009-10 California Recreational Alternatives					
		CA Rec. Alt 1	CA Rec. Alt 2	CA Rec. Alt 3	CA Rec. Alt 4	CA Rec. Alt 5	CA Rec. Alt 6
Greenlings	N	0.3	0.5	0.6	0.7	0.8	0.7
	NCN	0.6	0.6	0.9	0.9	1.3	2.0
	NCS	1.5	2.1	2.1	2.1	2.1	2.1
	SC - Mont	0.4	0.4	0.4	0.4	0.4	0.4
	SC - Morro	0.1	0.1	0.1	0.1	0.1	0.1
	S	0.0	0.0	0.0	0.0	0.0	0.0
	Total	2.8	3.6	4.0	4.2	4.6	5.3
Lingcod	N	10.9	20.4	24.4	29.9	34.9	29.9
	NCN	3.8	3.8	7.1	7.1	7.1	16.9
	NCS	57.3	80.4	80.4	80.4	80.4	80.4
	SC - Mont	8.2	9.1	8.2	8.2	8.2	9.1
	SC - Morro	22.4	24.7	22.4	22.4	22.4	24.7
	S	33.8	34.8	34.8	34.8	34.8	34.8
	Total	136.5	173.2	177.4	182.9	191.1	195.8
Blue	N	0.9	3.1	3.5	4.4	5.3	4.4
	NCN	0.9	1.7	3.0	3.0	4.2	6.7
	NCS	48.8	72.2	72.2	72.2	72.2	72.2
	SC - Mont	17.8	20.0	17.8	17.8	17.8	20.0
	SC - Morro	48.2	54.1	48.2	48.2	48.2	54.1
	S	11.3	11.4	11.4	11.4	11.4	11.4
	Total	127.9	162.5	156.1	157.0	159.1	164.0

Supplemental CDFG Report on Changes to Commercial Rockfish Conservation Area (RCA) Lines

Adjustments to RCA latitude and longitude lines in California are being proposed by industry and CDFG. Industry requests were made to better approximate depth contours, allowing access to valuable fishing grounds that otherwise would not be available under status quo. CDFG requests include error corrections as well as changes to depth contours affected by industry requests. All proposed changes were reviewed by CDFG Enforcement and verified that they do not conflict with Essential Fish Habitat Areas or Marine Protected Areas. Adjustments are necessary because substantial discrepancies exist between current and proposed depth contours, resulting in lost fishing grounds, lost revenue, and differences in actual versus predicted bycatch.

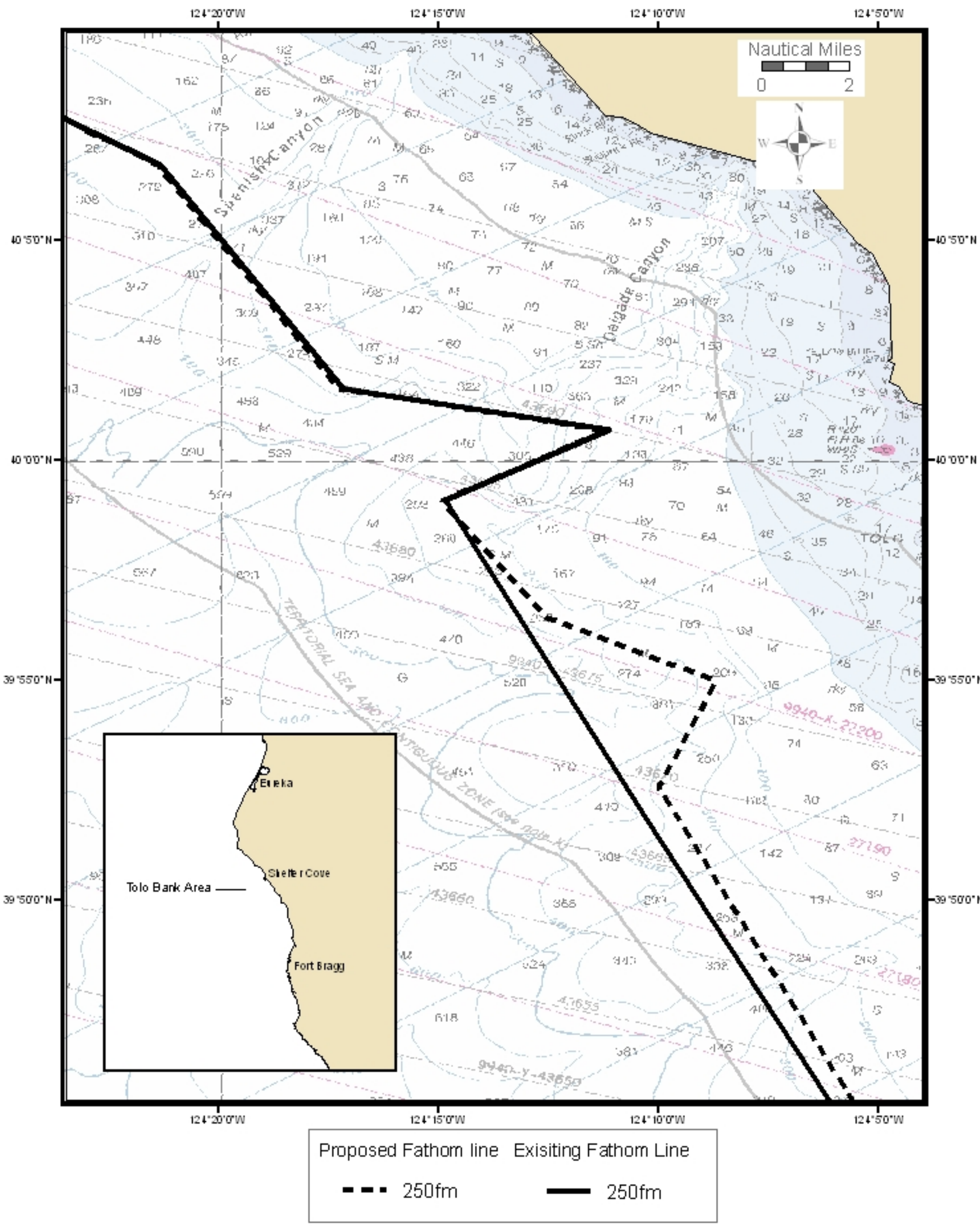
Two changes to trawl RCAs are proposed; thirteen changes to non-trawl RCAS are also proposed.

Lopez Point Area

These RCA points were revised due to an error:

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
	Point	Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
50-fm	120	36	10.41	N	121	42.88	crossover	seaward	36	10.41	W	121	42.92
60-fm	137	36	0	N	121	35.34	revision	seaward	36	0	W	121	35.15
75-fm	183	36	0	N	121	35.4	revision	seaward	36	0	W	121	35.15

CDFG Changes to 2009 - 2010 Commercial Groundfish Trawl
Rockfish Conservation Area Boundaries
- Tolo Bank Area -

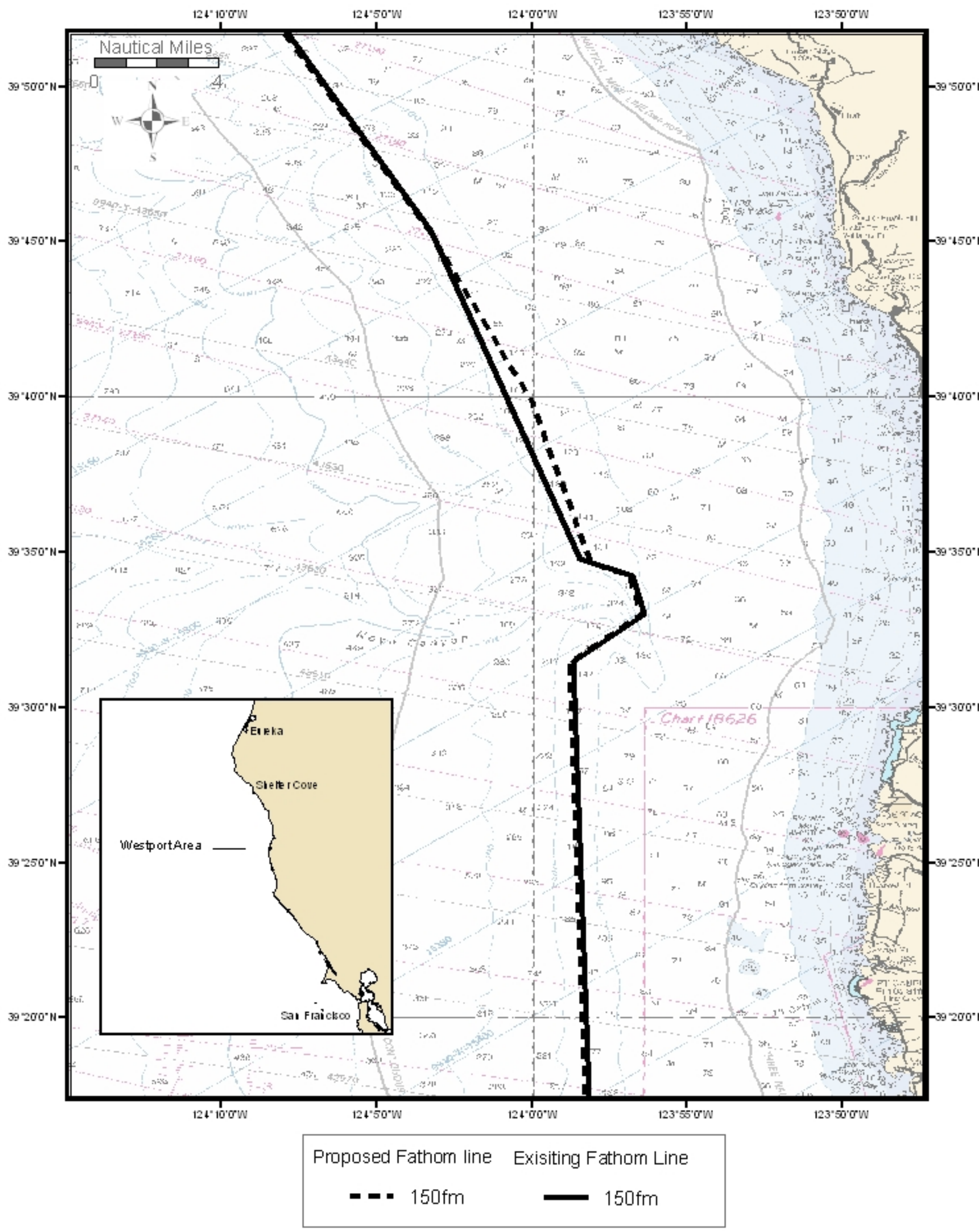


Tolo Bank

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in Federal Register				
	Point	Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
250-fm		39	56.44	N	124	12.52	add	shoreward					
250-fm		39	54.98	N	124	8.71	add	shoreward					
250-fm	119	39	52.6	N	124	10.01	revision	shoreward	39	51.85	W	124	10.33
250-fm	120	39	37.37	N	124	0.58	revision	shoreward	39	36.9	W	124	0.63

CDFG Changes to 2009 - 2010 Commercial Groundfish Trawl
Rockfish Conservation Area Boundaries

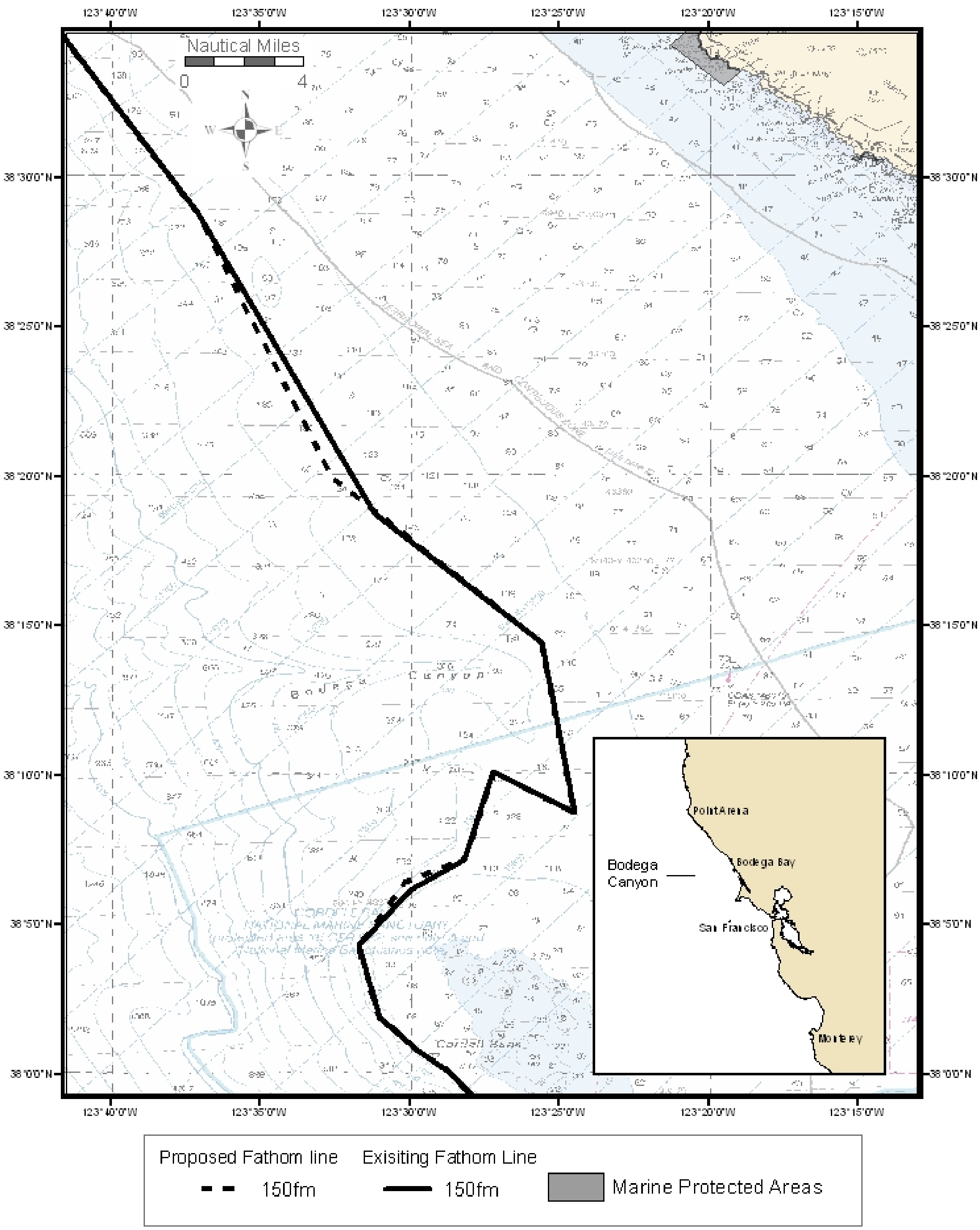
- Westport Area -



Westport Area

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in Federal Register				
	Point	Lat			Long				Lat			Long	
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
150-fm		39	39.82	N	123	59.98	add	shoreward					
150-fm	187	39	34.59	N	123	58.08	revision	shoreward	39	34.75	W	123	58.5

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl
Rockfish Conservation Area Boundaries
- Bodega Canyon -

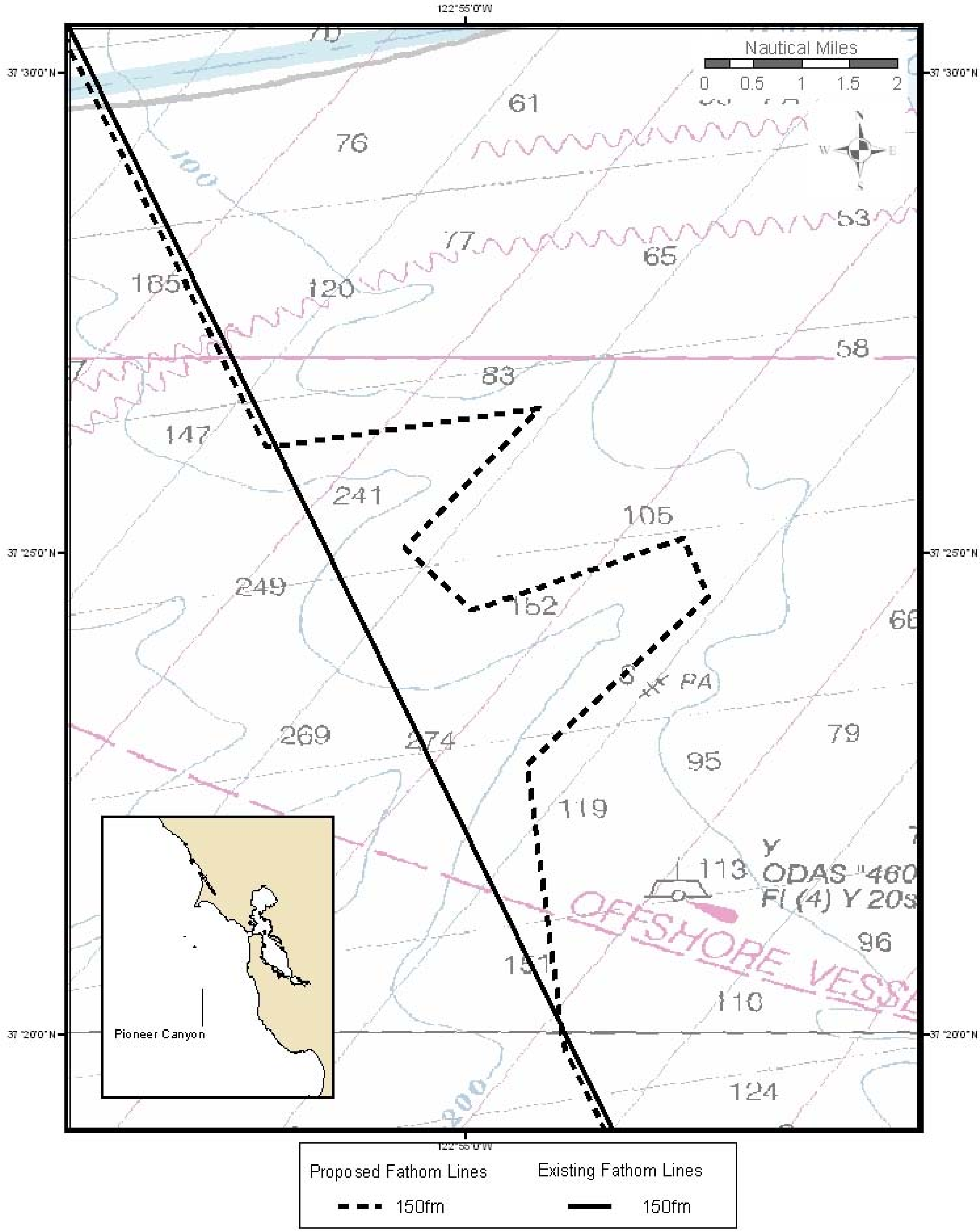


Bodega Canyon

Fathom Line	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
150-fm	200	38	18.75	N	123	31.21	revision	shoreward	38	19.88	W	123	32.54
150-fm	205	38	6.15	N	123	30	revision	shoreward	38	6.42	W	123	30.18

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- Pioneer Canyon -



Pioneer Canyon

Fathom Line	Point	Proposed Coordinates Lat Deg	Lat Min	Lat Dir	Long Deg	Long Min	Action	Long Change	Original Coordinates Published in the Federal Register Lat Deg	Lat Min	Dir	Long Deg	Long Min
150-fm		37	26.1	N	122	57.07	add	shoreward					
150-fm		37	26.51	N	122	54.23	add	shoreward					
150-fm		37	25.05	N	122	55.64	add	shoreward					
150-fm		37	24.42	N	122	54.94	add	shoreward					
150-fm		37	25.16	N	122	52.73	add	shoreward					
150-fm		37	24.55	N	122	52.48	add	shoreward					
150-fm		37	22.81	N	122	54.36	add	shoreward					
150-fm		37	19.87	N	122	53.98	add	shoreward					

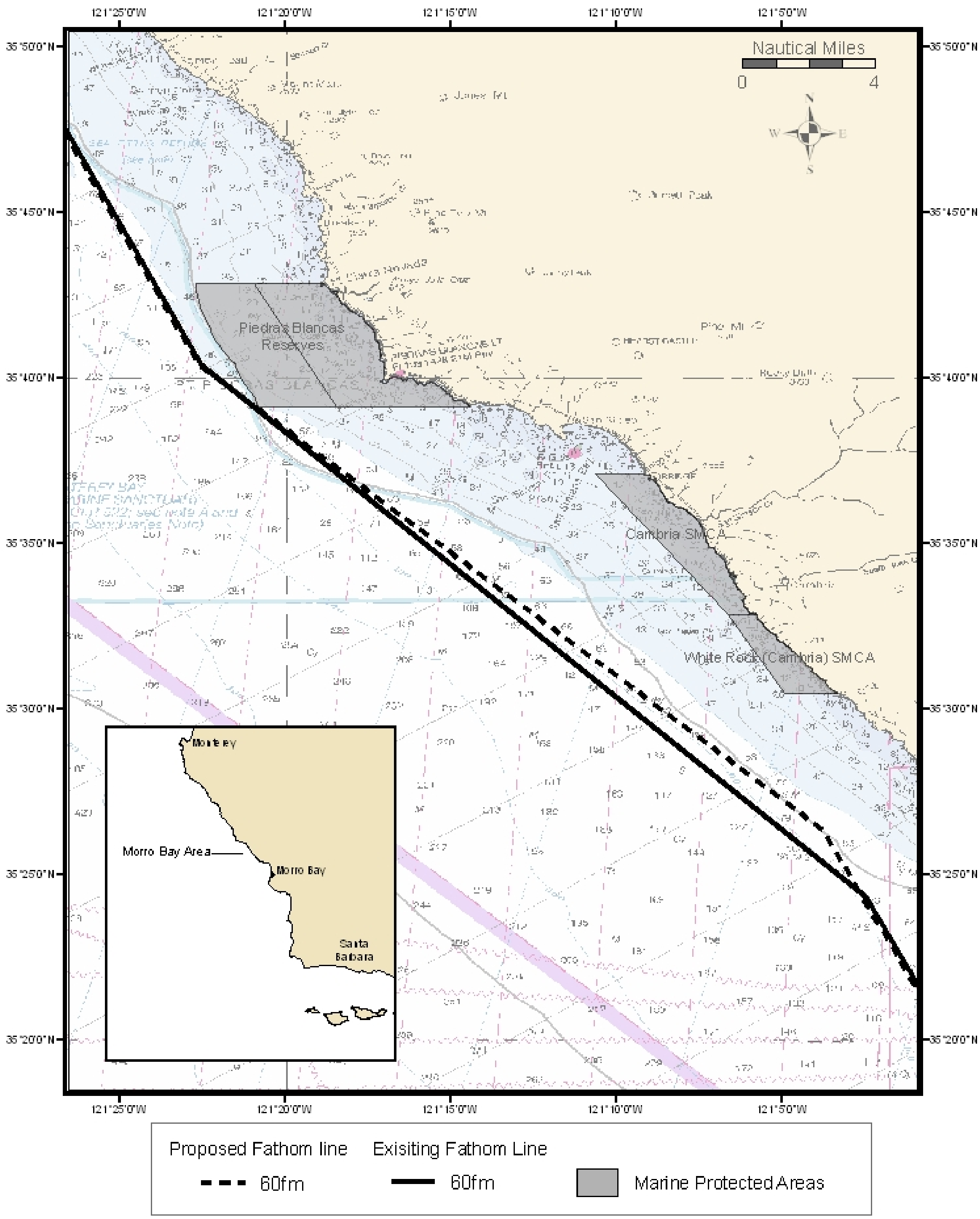
Other changes to the RCA required to accommodate Industry proposed changes:

Fathom Line	Point	Proposed Coordinates Lat Deg	Lat Min	Lat Dir	Long Deg	Long Min	Action	Long Change	Original Coordinates Published in the Federal Register Lat Deg	Lat Min	Dir	Long Deg	Long Min
75-fm		37	28.2	N	122	54.92	add	shoreward					
75-fm		37	27.34	N	122	52.91	add	shoreward					
75-fm		37	26.45	N	122	52.95	add	shoreward					
75-fm	144	37	26.06	N	122	51.17	revision	shoreward	37	24.16	W	122	51.96
75-fm	145	37	23.07	N	122	51.34	revision	shoreward	37	23.32	W	122	52.38

100-fm		37	26.81	N	122	55.57	add	shoreward					
100-fm		37	26.78	N	122	53.91	add	shoreward					
100-fm		37	25.74	N	122	54.13	add	shoreward					
100-fm		37	25.33	N	122	53.59	add	shoreward					
100-fm		37	25.29	N	122	52.57	add	shoreward					
100-fm		37	24.5	N	122	52.09	add	shoreward					
100-fm		37	23.25	N	122	53.12	add	shoreward					

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- Morro Bay Area -

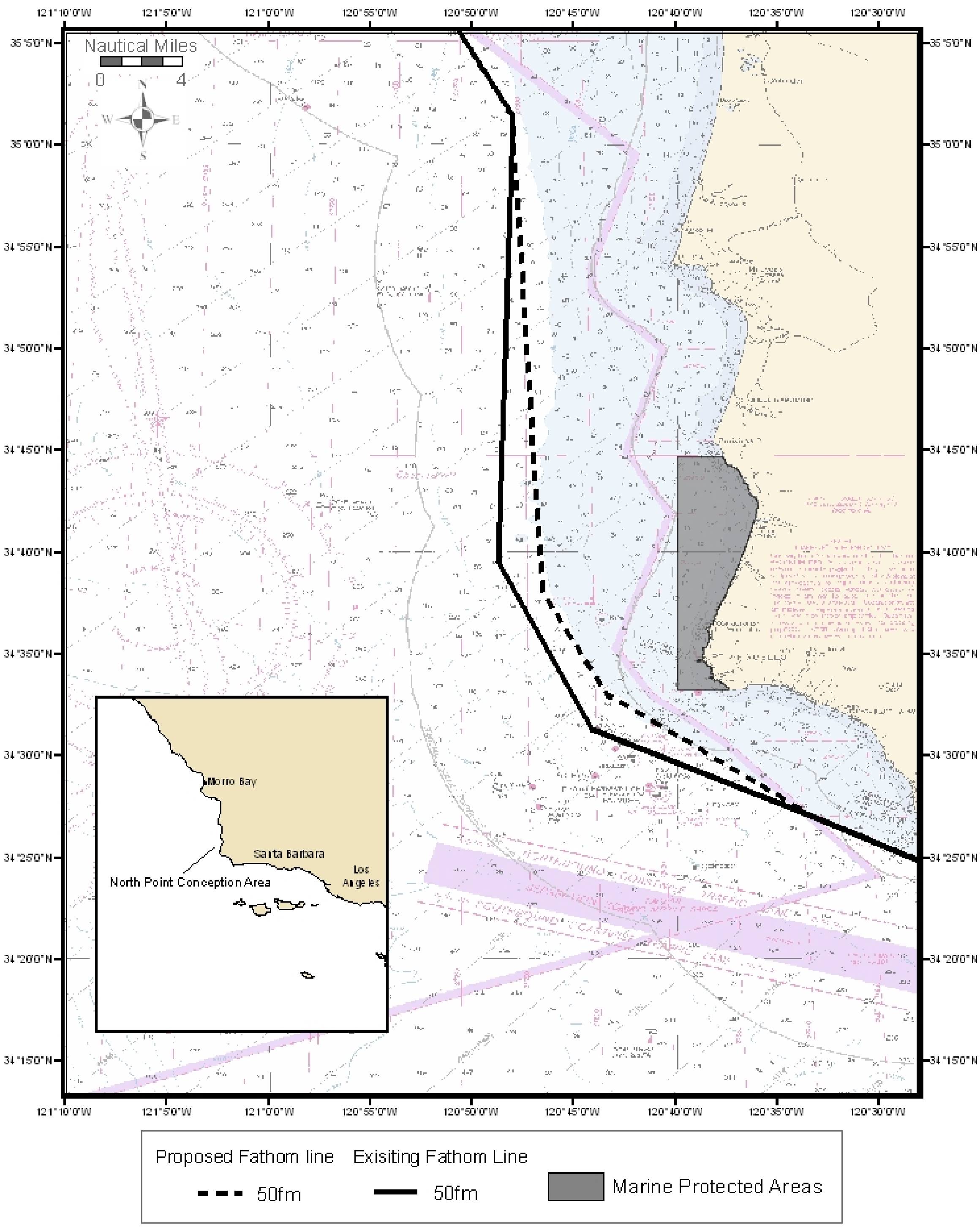


Morro Bay Area

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
	Point	Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
50-fm	126	35	27.74	N	121	4.69	revision	shoreward	35	24.35	W	121	2.53
60-fm	140	35	26.31	N	121	3.73	revision	shoreward	35	24.35	W	121	2.53
75-fm	186	35	25.09	N	121	3.02	revision	shoreward	35	24.33	W	121	2.53
100-fm	251	36	0	N	121	35.41	revision	seaward	36	0	W	121	35.15
100-fm	252	35	57.84	N	121	32.81	revision	shoreward	35	57.84	W	121	33.1

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- North Point Conception -

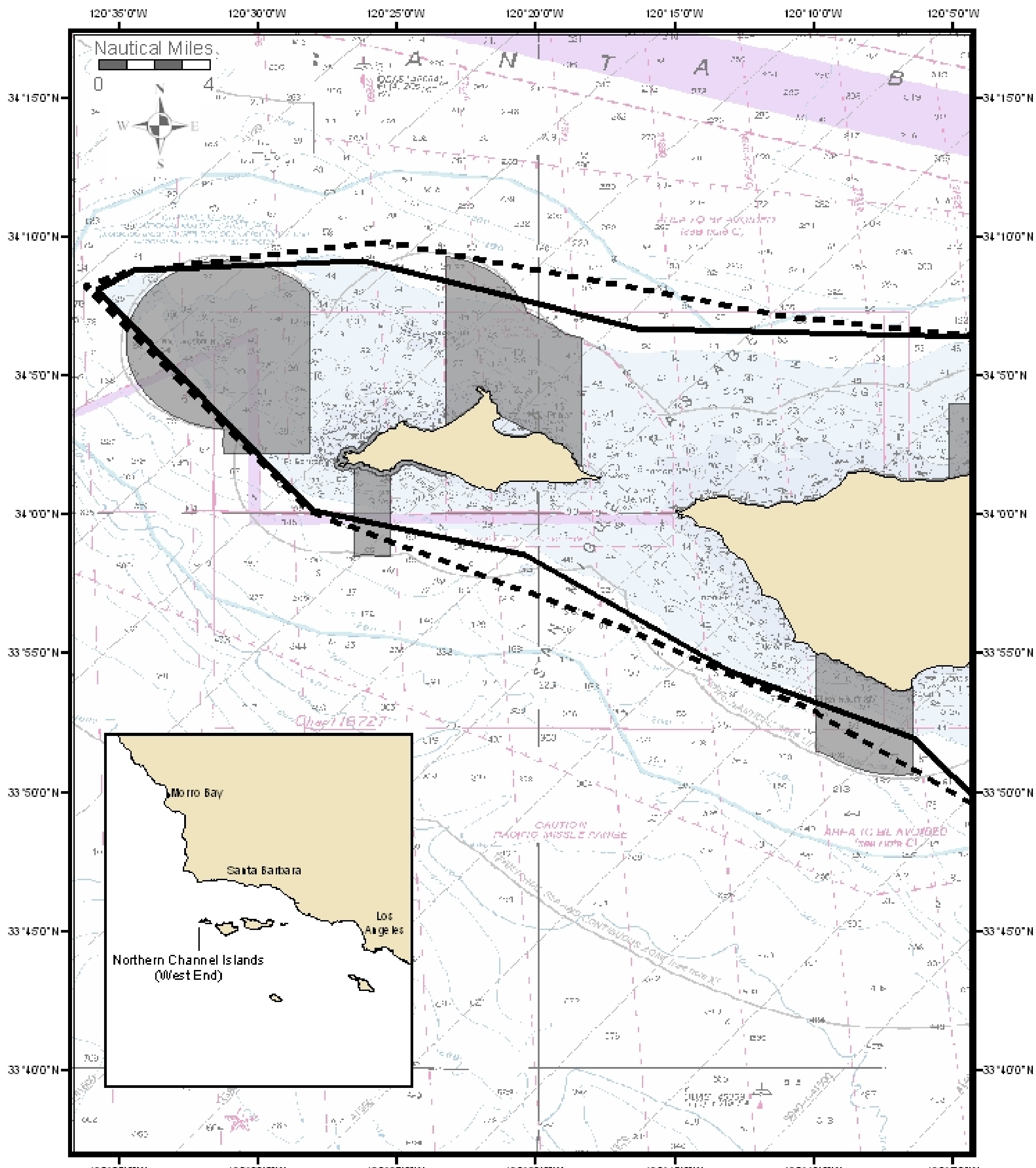


North Point Conception Area

Fathom Line	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
50-fm	128	34	37.98	N	120	46.48	revision	shoreward	34	39.52	W	120	48.72
50-fm	129	34	32.98	N	120	43.34	revision	shoreward	34	31.26	W	120	44.12

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- Northern Channel Islands, West End -



Proposed Fathom line: 60fm
Exisiting Fathom Line: 60fm
Marine Protected Areas

North Channel Island Area

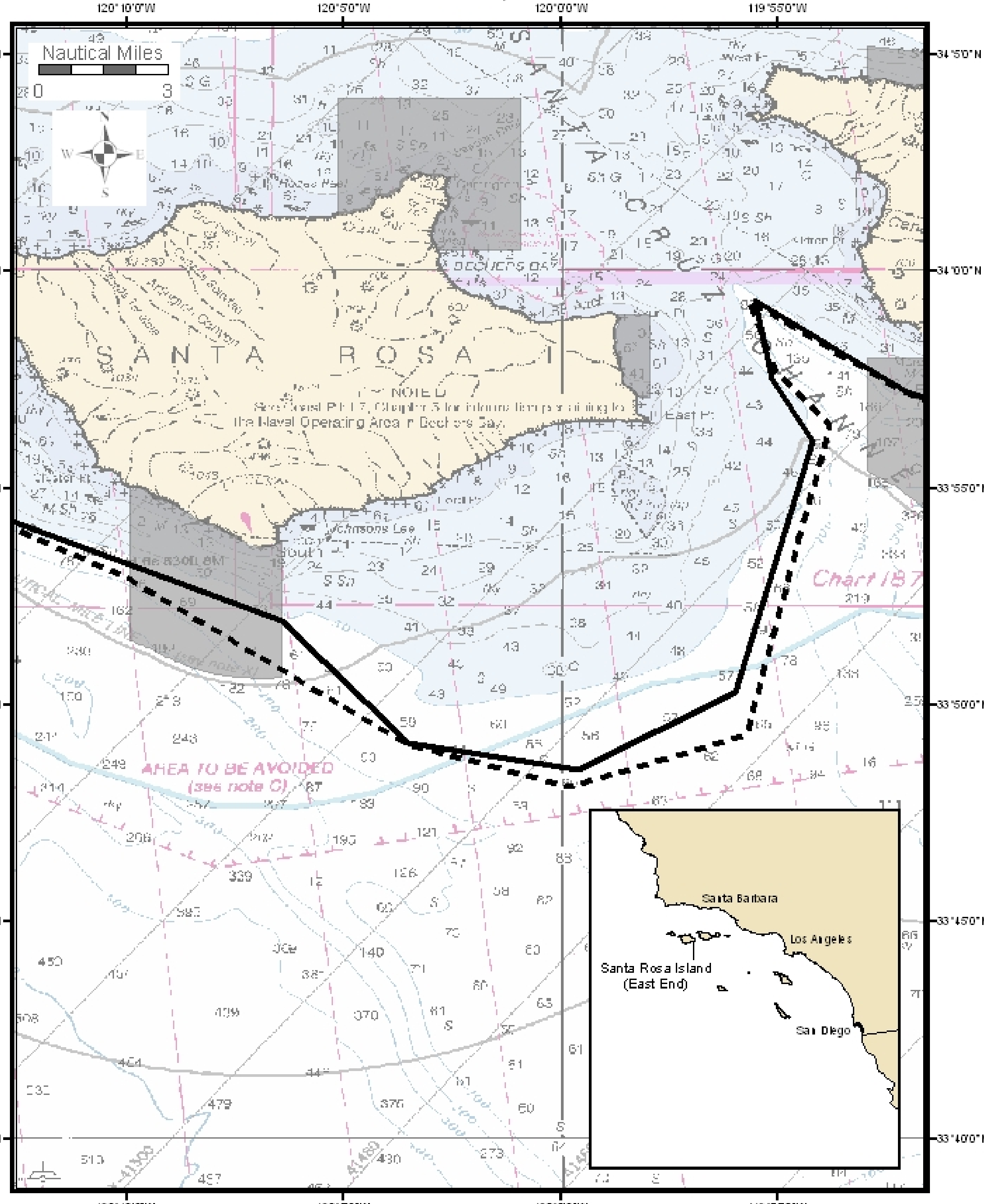
Fathom Line	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	23	33	52.95	N	120	10	revision	seaward	33	51.93	W	120	6.5
60-fm	24	33	54.36	N	120	13.06	delete		33	54.36	W	120	13.06
60-fm	25	33	56	N	120	17	revision	seaward	33	58.53	W	120	20.46

Other changes to the RCA required to accommodate Industry proposed changes:

Fathom Ling	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	1	34	9.83	N	120	25.61	revision	seaward	34	9.16	W	120	26.31
60-fm	2	34	7.03	N	120	10.55	revision	seaward	34	6.69	W	120	16.43
60-fm	27	34	8.23	N	120	36.25	revision	seaward	34	8.09	W	120	35.85
60-fm	29	34	9.83	N	120	25.61	revision	seaward	34	9.16	W	120	26.31

75-fm	1	34	10.82	N	120	33.26	revision	seaward	34	9.12	W	120	35.03
75-fm	2	34	11.78	N	120	28.12	revision	seaward	34	9.99	W	120	27.85
75-fm	3	34	8.65	N	120	18.46	revision	seaward	34	7.19	W	120	16.28
75-fm		34	7.01	N	120	10.46	add	seaward					
75-fm	29	33	52.99	N	120	10.01	delete		33	52.99	W	120	10.01
75-fm	30	33	56.64	N	120	18.88	delete		33	56.64	W	120	18.88
75-fm	31	33	58.02	N	120	21.41	delete		33	58.02	W	120	21.41
75-fm	32	33	58.11	N	120	25.59	revision	seaward	33	58.73	W	120	25.22
75-fm	33	33	59.08	N	120	26.58	delete		33	59.08	W	120	26.58
75-fm	34	33	59.95	N	120	28.21	delete		33	59.95	W	120	28.21
75-fm	35	34	2.15	N	120	32.7	revision	seaward	34	3.54	W	120	32.23
75-fm	36	34	5.57	N	120	34.23	delete		34	5.57	W	120	34.23
75-fm	37	34	8.86	N	120	37.12	revision	seaward	34	8.13	W	120	36.05
75-fm	38	34	10.82	N	120	33.26	revision	seaward	34	9.12	W	120	35.03

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl
Rockfish Conservation Area Boundaries
- Santa Rosa Island, East End Area -



Proposed Fathom line — 60fm
Exisiting Fathom Line — 60fm
Marine Protected Areas

Santa Rosa Island (East End)

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
	Point	Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	20	33	49.29	N	119	55.76	revision	seaward	33	50.28	W	119	56.02
60-fm	21	33	48.11	N	119	59.72	revision	seaward	33	48.51	W	119	59.67

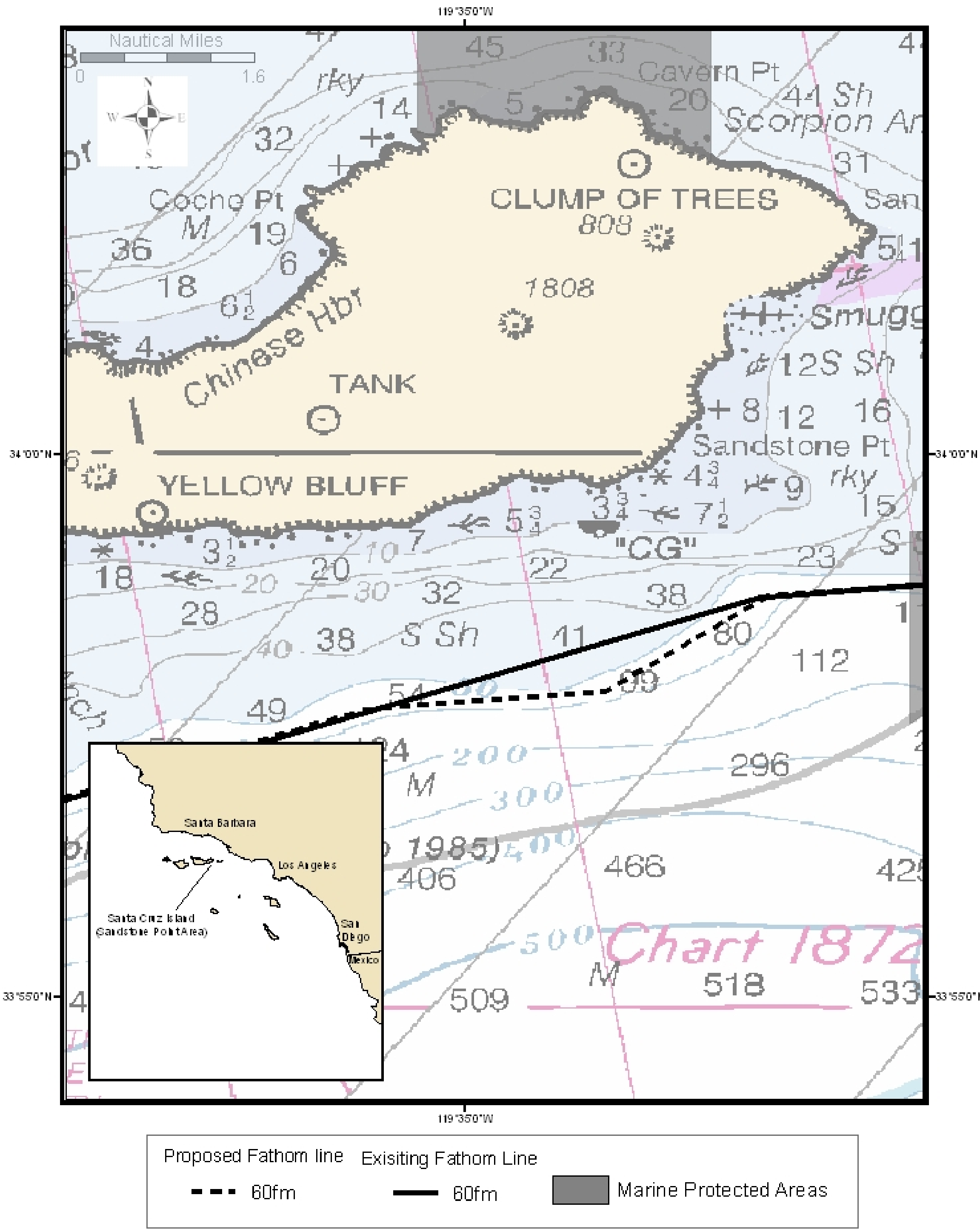
Other changes to the RCA required to accommodate Industry proposed changes:

Fathom Ling	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
	Point	Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	4	34	7.9	N	119	55.12	revision	seaward	34	7.36	W	119	52.06
60-fm	17	33	59.32	N	119	55.65	revision	seaward	33	59.32	W	119	55.59
60-fm	18	33	57.73	N	119	55.06	revision	seaward	33	57.52	W	119	55.19
60-fm	19	33	56.48	N	119	53.8	revision	seaward	33	56.1	W	119	54.25

75-fm	5	34	8.11	N	119	55.01	revision	seaward	34	7.27	W	119	57.76
75-fm	6	34	7.48	N	119	52.08	delete		34	7.48	W	119	52.08
75-fm	18	33	56.91	N	119	52.04	revision	seaward	33	57.78	W	119	53.04
75-fm	20	33	57.82	N	119	54.99	revision	seaward	33	57.57	W	119	54.93
75-fm	21	33	56.58	N	119	53.75	revision	seaward	33	56.35	W	119	53.91
75-fm	28	33	52	N	120	8.15	revision	seaward	33	51.41	W	120	6.49

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl
Rockfish Conservation Area Boundaries

- Santa Cruz, Sandstone Point Area -



Santa Cruz Island, Sandstone Point Area

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in Federal Register				
	Point	Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm		33	57.81	N	119	33.72	add	seaward					
60-fm		33	57.65	N	119	35.94	add	seaward					

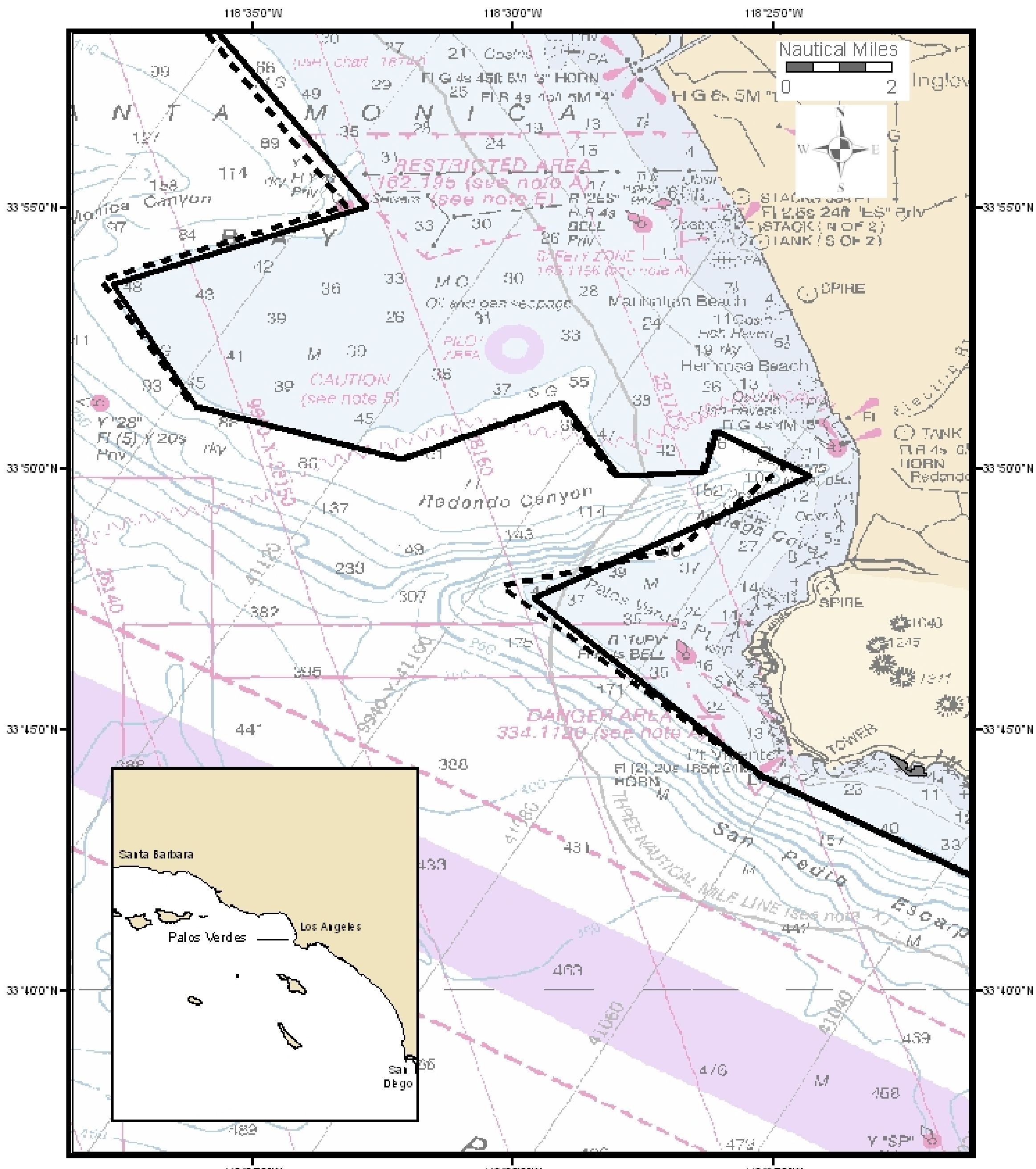
Other changes to the RCA required to accommodate Industry proposed changes:

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
	Point	Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	5	34	5.07	N	119	37.33	revision	seaward	34	4.84	W	119	36.94
60-fm	6	34	4.84	N	119	35.5	delete		34	4.84	W	119	35.5
60-fm	9	34	2.8	N	119	21.4	delete		34	2.8	W	119	21.4
60-fm	10	34	2.27	N	119	18.73	revision	seaward	34	2.36	W	119	18.97
60-fm	11	34	0.98	N	119	19.1	revision	seaward	34	0.65	W	119	19.42
60-fm	12	33	59.44	N	119	21.89	revision	seaward	33	59.45	W	119	22.38
60-fm	13	33	58.7	N	119	32.22	revision	seaward	33	58.68	W	119	32.36

75-fm	11	34	3	N	119	21.36	delete		34	3	W	119	21.36
75-fm	13	34	0.95	N	119	18.95	revision	seaward	34	0.65	W	119	19.42
75-fm	14	33	59.4	N	119	21.74	revision	seaward	33	59.45	W	119	22.38
75-fm	15	33	58.7	N	119	32.21	revision	seaward	33	58.68	W	119	32.36
75-fm		33	57.67	N	119	33.72	add	seaward					
75-fm		33	57.54	N	119	36.32	add	seaward					
75-fm	5	33	26.33	N	118	25.37	revision	seaward	33	26.31	W	118	25.14
75-fm	12	33	20.07	N	118	32.35	revision	seaward	33	20.07	W	118	32.12
75-fm	13	33	21.82	N	118	32.09	revision	seaward	33	21.77	W	118	31.85
75-fm	17	33	27.57	N	118	37.9	revision	seaward	33	27.8	W	118	37.9

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- Palos Verdes -



Proposed Fathom line — 60fm

Exisiting Fathom Line — 60fm

Marine Protected Area

Palos Verdes Area

Fathom Line	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat			Long	
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm		33	48.48	N	118	26.86	add	shoreward					
60-fm	170	33	47.75	N	118	30.21	revision	seaward	33	47.54	W	118	29.65

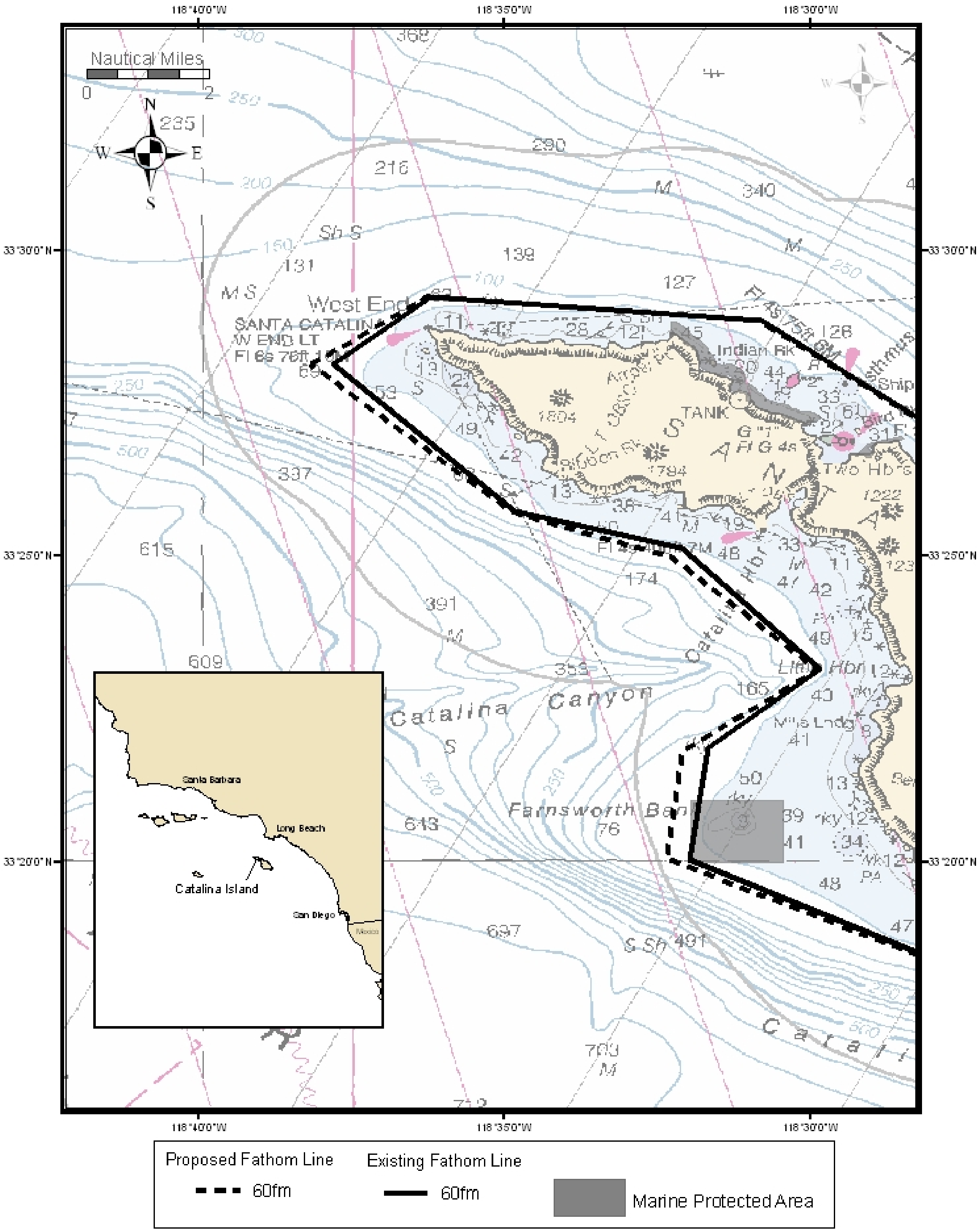
Other changes to the RCA required to accommodate Industry proposed changes:

Fathom Line	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat			Long	
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	160	33	58.86	N	118	36.24	revision	seaward	33	59.06	W	118	36.3
60-fm	162	33	53.63	N	118	37.88	revision	seaward	33	53.56	W	118	37.73
60-fm	169	33	50.06	N	118	24.79	revision	seaward	33	49.87	W	118	24.37

75-fm	206	33	59.56	N	119	3.36	revision	seaward	33	59.6	W	119	3.16
75-fm	207	33	59.35	N	119	0.92	revision	seaward	33	59.46	W	119	0.88
75-fm	213	33	51.19	N	118	36.5	revision	seaward	33	51.22	W	118	36.17
75-fm	216	33	49.77	N	118	26.34	revision	seaward	33	49.95	W	118	26.38
75-fm	218	33	49.92	N	118	25.05	revision	seaward	33	49.84	W	118	24.78
75-fm		33	48.7	N	118	26.7	add	shoreward					
75-fm	219	33	47.72	N	118	30.48	revision	seaward	33	47.53	W	118	30.12
75-fm	221	33	41.62	N	118	20.31	revision	seaward	33	41.77	W	118	20.32
75-fm	222	33	38.15	N	118	15.85	revision	seaward	33	38.17	W	118	15.7

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- Catalina Island, West End -



Catalina Island

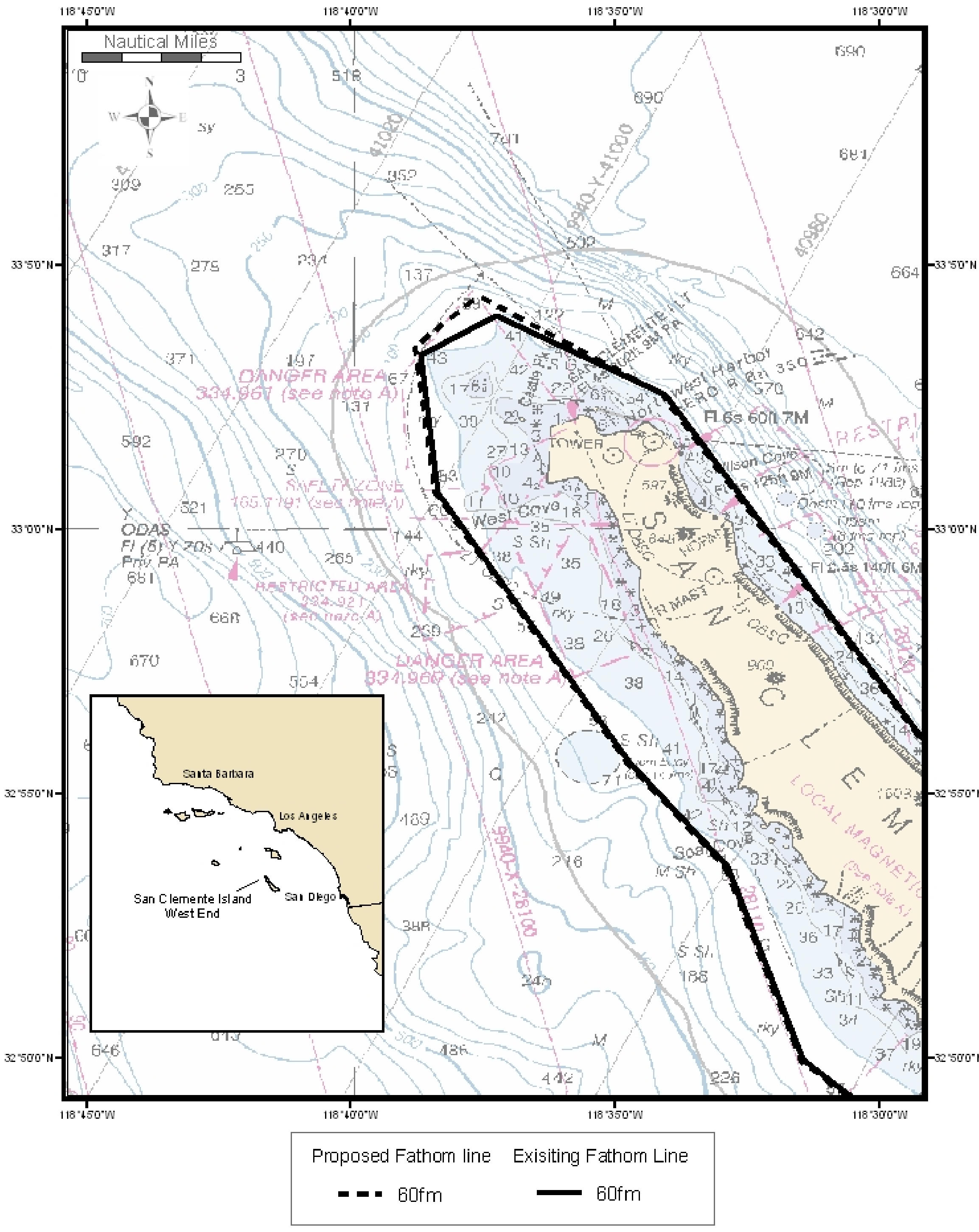
Fathom Line	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	1	33	28.15	N	118	38.17	revision	seaward	33	28.15	W	118	37.85
60-fm	14	33	24.99	N	118	32.25	revision	seaward	33	25.13	W	118	32.16
60-fm	16	33	28.15	N	118	38.17	revision	seaward	33	28.15	W	118	37.85

Other changes to the RCA required to accommodate Industry proposed changes:

Fathom Line	Point	Proposed Coordinates					Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm		33	26.3	N	118	25.38	add	seaward					
60-fm	9	33	16.65	N	118	17.71	revision	seaward	33	16.72	W	118	18.07
60-fm	11	33	20.07	N	118	32.34	revision	seaward	33	20.03	W	118	32.04
60-fm	12	33	21.82	N	118	32.08	revision	seaward	33	21.86	W	118	31.72

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- San Clemente Island, West End -

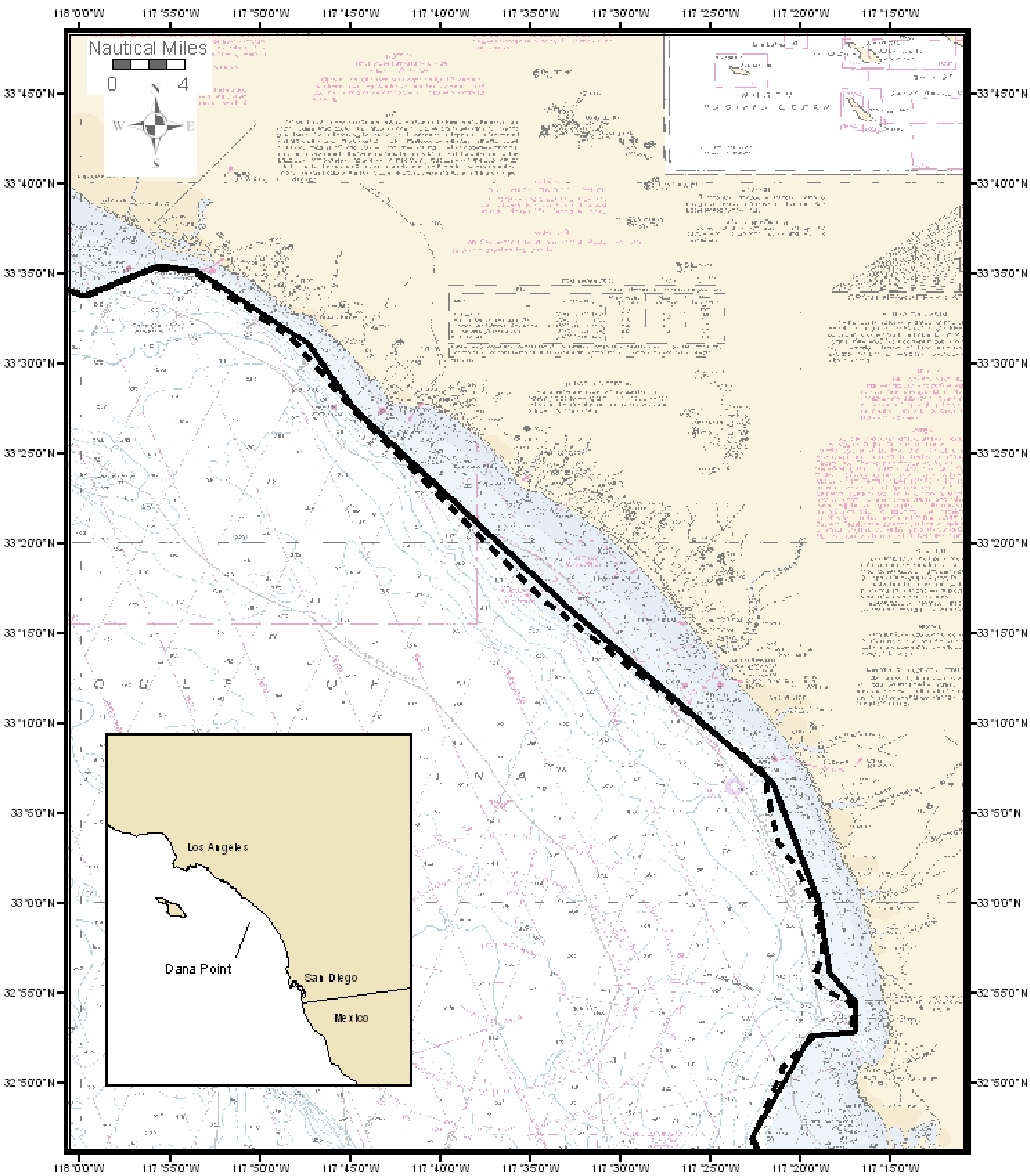


San Clemente Island (West End)

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
	Point	Lat			Long				Lat		Long		
		Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	1	33	4.44	N	118	37.61	revision	seaward	33	4.06	W	118	37.32
60-fm	13	33	3.49	N	118	38.81	revision	seaward	33	3.31	W	118	38.74
60-fm	14	33	4.44	N	118	37.61	revision	seaward	33	4.06	W	118	37.32

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- Dana Point Area -



Proposed Fathom line: 60fm (dashed line)

Exisiting Fathom Line: 60fm (solid line)

Dana Point Area

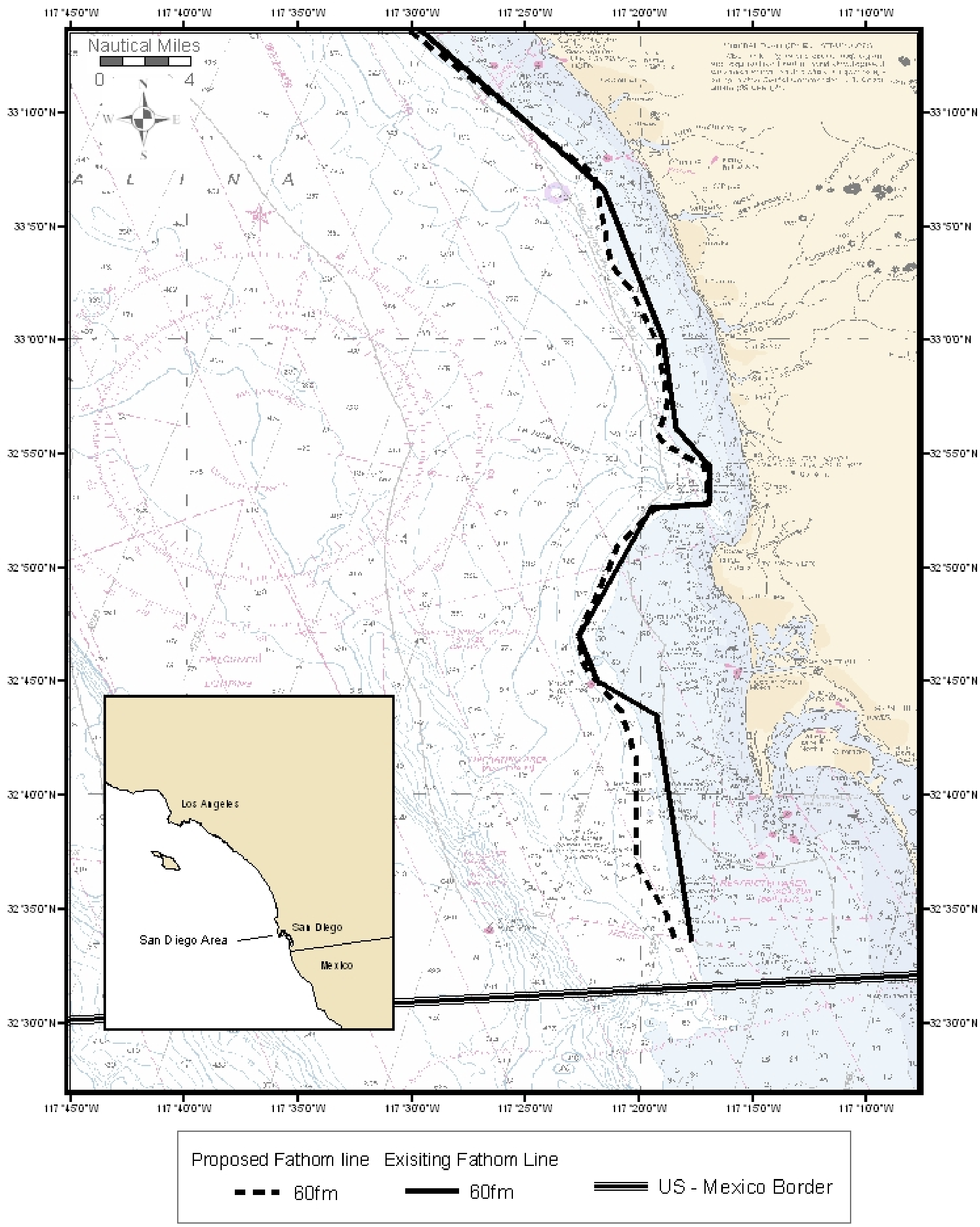
Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
	Point	Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
50-fm	170	33	35.53	N	118	6.66	revision	seaward	33	35.85	W	118	7
50-fm	171	33	35.93	N	118	4.78	revision	seaward	33	36.12	W	118	4.15
50-fm	173	33	33.84	N	117	59.77	revision	seaward	33	34	W	117	59.53
50-fm	174	33	35.33	N	117	55.89	revision	seaward	33	35.44	W	117	55.67
50-fm	175	33	35.05	N	117	53.72	revision	seaward	33	35.15	W	117	53.55
50-fm	176	33	31.32	N	117	48.01	revision	seaward	33	31.12	W	117	47.4
50-fm	178	33	26.93	N	117	44.24	revision	seaward	33	26.93	W	117	43.98
50-fm	179	33	25.46	N	117	42.06	revision	seaward	33	25.44	W	117	41.63
50-fm	180	33	18.45	N	117	35.73	revision	seaward	33	19.5	W	117	36.08
50-fm	181	33	12.74	N	117	28.53	delete		33	12.74	W	117	28.53
50-fm	183	33	7.47	N	117	21.62	revision	seaward	33	7.5	W	117	21.52
50-fm		33	4.47	N	117	21.24	add	seaward					

60-fm	175	33	35.8	N	118	16.65	revision	seaward	33	35.98	W	118	16.54
60-fm	176	33	33.92	N	118	11.36	revision	seaward	33	34.15	W	118	11.22
60-fm	180	33	35.25	N	117	55.89	revision	seaward	33	35.44	W	117	55.65
60-fm	181	33	35.03	N	117	53.8	revision	seaward	33	35.15	W	117	53.54
60-fm	182	33	31.37	N	117	48.15	revision	seaward	33	31.12	W	117	47.39
60-fm	184	33	16.63	N	117	34.01	revision	seaward	33	16.42	W	117	32.92
60-fm	185	33	7.21	N	117	21.96	revision	seaward	33	6.66	W	117	21.59
60-fm		33	3.35	N	117	21.22	add	seaward					
60-fm		33	2.14	N	117	20.26	add	seaward					

75-fm	223	33	37.53	N	118	16.82	revision	seaward	33	37.48	W	118	16.73
75-fm	224	33	35.76	N	118	16.75	revision	seaward	33	36.01	W	118	16.55
75-fm	228	33	33.67	N	117	59.98	revision	seaward	33	33.75	W	117	59.82
75-fm	229	33	34.98	N	117	55.66	revision	seaward	33	35.1	W	117	55.68
75-fm	230	33	34.84	N	117	53.83	revision	seaward	33	34.91	W	117	53.76
75-fm	231	33	31.43	N	117	48.76	revision	seaward	33	30.77	W	117	47.56
75-fm	232	33	27.5	N	117	44.87	delete		33	27.5	W	117	44.87
75-fm	233	33	16.61	N	117	34.49	revision	seaward	33	16.89	W	117	34.37
75-fm	234	33	7.43	N	117	22.4	revision	seaward	33	6.66	W	117	21.59
75-fm	235	33	2.93	N	117	21.12	revision	seaward	33	3.35	W	117	20.92
75-fm		33	2.09	N	117	20.28	add	seaward					

CDFG Changes to 2009 - 2010 Commercial Groundfish Non - Trawl Rockfish Conservation Area Boundaries

- San Diego Area -



San Diego Area

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
	Point	Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
60-fm	186	32	59.87	N	117	19.16	revision	seaward	33	0.08	W	117	19.02
60-fm		32	57.39	N	117	18.72	add	seaward					
60-fm	187	32	55.87	N	117	19.17	revision	seaward	32	56.11	W	117	18.41
60-fm		32	55.31	N	117	18.8	add	seaward					
60-fm	188	32	54.38	N	117	17.09	revision	seaward	32	54.43	W	117	16.93
60-fm	189	32	52.81	N	117	16.94	revision	seaward	32	51.89	W	117	16.42
60-fm	190	32	52.56	N	117	19.3	revision	seaward	32	52.61	W	117	19.5
60-fm		32	50.86	N	117	20.98	add	seaward					
60-fm		32	45.58	N	117	22.38	add	seaward					
60-fm	193	32	43.6	N	117	20.72	revision	seaward	32	43.52	W	117	19.32
60-fm		32	41.52	N	117	20.12	add	seaward					
60-fm		32	37	N	117	20.1	add	seaward					
60-fm		32	34.76	N	117	18.77	add	seaward					
60-fm	194	32	33.7	N	117	18.46	revision	seaward	32	33.56	W	117	17.72

Other changes to the RCA required to accommodate Industry proposed changes:

Fathom Line	Proposed Coordinates						Action	Long Change	Original Coordinates Published in the Federal Register				
		Lat			Long				Lat		Long		
	Point	Deg	Min	Dir	Deg	Min			Deg	Min	Dir	Deg	Min
50-fm	184	32	59.89	N	117	19.11	revision	seaward	32	59.77	W	117	18.83
50-fm		32	57.41	N	117	18.64	add	seaward					
50-fm	185	32	55.71	N	117	18.99	revision	seaward	32	56.1	W	117	18.37
50-fm	187	32	52.34	N	117	16.73	revision	seaward	32	51.89	W	117	16.42
50-fm		32	52.64	N	117	17.76	add	seaward					
50-fm	190	32	45.09	N	117	20.68	delete		32	45.09	W	117	20.68
50-fm	191	32	41.93	N	117	19.68	revision	seaward	32	43.62	W	117	18.68
50-fm	192	32	33.59	N	117	17.89	revision	seaward	32	33.43	W	117	17

75-fm	236	32	59.91	N	117	19.28	revision	seaward	33	0.07	W	117	19.02
75-fm		32	57.27	N	117	18.82	add	seaward					
75-fm	237	32	56.17	N	117	19.43	revision	seaward	32	55.99	W	117	18.6
75-fm		32	55.22	N	117	19.09	add	seaward					
75-fm	238	32	54.3	N	117	17.13	revision	seaward	32	54.43		117	16.93
75-fm	239	32	52.89	N	117	17.03	revision	seaward	32	52.13	W	117	16.55
75-fm		32	50.85	N	117	21.14	add	seaward					
75-fm	241	32	47.11	N	117	22.95	revision	seaward	32	46.95	W	117	22.81
75-fm	242	32	45.66	N	117	22.6	revision	seaward	32	45.01	W	117	22.07
75-fm	243	32	42.99	N	117	20.7	revision	seaward	32	43.4	W	117	19.8
75-fm		32	40.72	N	117	20.23	add	seaward					
75-fm		32	38.11	N	117	20.59	add	seaward					
75-fm	244	32	33.83	N	117	19.18	revision	seaward	32	33.74	W	117	18.67

100-fm	294	32	53.36	N	117	19.97	revision	seaward	32	53.34	W	117	19.13

Response to Request for Spatial Analysis of NWFSC Groundfish Bottom Trawl Survey and West Coast Groundfish Observer Program Data for Canary and Yelloweye Rockfish

Northwest Fisheries Science Center
May 30th, 2008

On March 28, 2008 the Northwest Fisheries Science Center received a request from Mr. John DeVore of the Pacific Fishery Management Council staff for analysis of West Coast Groundfish Observer Program (WCGOP) and NWFSC groundfish bottom trawl survey data for use by the Groundfish Management Team (GMT) in identifying areas with higher densities and higher bycatch rates of canary and yelloweye rockfish.

To fulfill this request and make additional spatial representations and discard rates available, the Northwest Fisheries Science Center in collaboration with the College of Oceanic and Atmospheric Sciences at Oregon State University has posted NWFSC bottom trawl survey and aggregated observer data for selected species on the Pacific Coast Ocean Observer System's (PaCOOS) West Coast Habitat Server (http://pacoos.coas.oregonstate.edu/). Map representations of groundfish bottom trawl survey and observer data are available via this portal, as well as tabular data for survey fish catch and observed discard rates. See the information below for specific details on the creation of these data products, as well as instructions on how to review and access these data products from the website.

PaCOOS data products originate from data collected by fishery observers in the West Coast Groundfish Observer Program (WCGOP), Fishery Resource Analysis and Monitoring Division (FRAM) at the Northwest Fisheries Science Center, NOAA Fisheries. The WCGOP's goal is to improve total catch estimates by collecting information on the discarded catch (fish returned overboard at-sea) of west coast groundfish species. All data were collected according to standard protocols and data quality control established by the WCGOP. The observed portion of overall catch or landings in a fishery varies by coverage level. Since all fishing operations are not observed, neither the maps nor the data can be used to characterize the fishery completely. This is especially true for rarely-occurring species and when observed sample sizes are small. We urge caution when utilizing these data due to the complexity of groundfish management and fleet harvest dynamics. Grid cells representing less than 3 vessels and less than 10 hauls or sets are not shown to preserve confidentiality and to ensure adequate sample size. In the limited-entry groundfish bottom trawl fishery, species discard rates (species discard weight / groundfish total catch (discard + retained weight)) are categorized by approximate quartile ranges and geo-referenced to 10 x 10 kilometer grid cells. The observed trawl towline (line drawn from the start to end location of a trawl tow) was used to allocate data to 10 x 10 kilometer grid cells for calculation. In the limited-entry fixed gear fishery, species discard rates (species discard weight / groundfish total catch (discard + retained weight)) are categorized by approximate quartile ranges and geo-referenced to 20 x 20 kilometer grid cells. The observed fixed gear set location (start location of fishing) was used to allocate data to 20 x 20 kilometer grid cells for calculation. Seventeen species in the bottom trawl fishery and sixteen species in the fixed gear fishery are represented based on combined observer data from 2002-2006. The species included are dover sole (*Microstomus pacificus*), sablefish (*Anoplopoma fimbria*), longspine thornyhead (*Sebastolobus altivelis*), shortspine thornyhead (*Sebastolobus alascanus*), lingcod (*Ophiodon elongatus*), arrowtooth flounder (*Atheresthes stomias*), english sole (*Parophrys vetulus*), petrale sole (*Eopsetta jordani*), and the rockfishes (genus *Sebastes*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), chilipepper (*S. goodei*), cowcod (*S. levis*), bocaccio (*S. paucispinis*), canary rockfish (*S. pinniger*), widow rockfish (*S. entomelas*), yelloweye rockfish (*S. ruberrimus*), and yellowtail rockfish (*S. flavidus*). Tabular data available for download within the PaCOOS application provide data fields identifying the fishery, data years, scientific name and common name for each species; a coded identifier, center latitude, and center longitude for each grid cell; and a discard rate for each species within each grid cell.

Selected catch data from the NWFSC West Coast Groundfish Trawl Survey were extracted and formatted for inclusion in the Pacific Coast Ocean Observing System (PaCOOS) West Coast Habitat Portal. This ongoing series of annual surveys is designed to monitor long-term trends in distribution and abundance of west coast groundfish, especially those species of management concern, along the entire continental U.S. West Coast. Effort-normalized catch weights (catch per unit effort in kilograms per square meter), categorized by approximate quartile catch ranges for each species within a survey year and geo-referenced to the sample trawl location, were provided to meet the requirements for spatial display. Geo-referenced catch ranges for eleven species were included in the data product. These catch weight ranges and associated trawl locations are also available by download within the PaCOOS application. The species included for the years 2003-2005 are dover sole (*Microstomus pacificus*), sablefish (*Anoplopoma fimbria*), longspine thornyhead (*Sebastolobus altivelis*), shortspine thornyhead (*Sebastolobus alascanus*), arrowtooth flounder (*Atheresthes stomias*), english sole (*Parophrys vetulus*), petrale sole (*Eopsetta jordani*), and the rockfishes (genus *Sebastes*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), chilipepper (*S. goodei*), cowcod (*S. levis*), bocaccio (*S. paucispinis*), widow rockfish (*S. entomelas*), yelloweye rockfish (*S. ruberrimus*), and yellowtail rockfish (*S. flavidus*).

General Guidelines for Review of PaCOOS Observer and Survey Data Products

Start at the main PaCOOS website: http://pacoos.coas.oregonstate.edu/ .

Under the Help tab, tutorials are available for assistance with general navigation of the site, and how to use the data portal and fish viewer.

To review the species maps, click the Launch button under Map Viewer. In the Table of Contents, select the white check box for Fish and Invertebrate Data, then the FRAM Groundfish Survey data by year and then species, and finally by clicking on the white check box to the left of the species common name. In the Table of Contents, select the white check box for Fish and Invertebrate Data, then the FRAM Observer Data for Fixed Gear or Trawl Gear and then species, and finally by clicking on the white check box to the left of the species common name.

To see the legend for each species, right click on the species name and the values for the map representation will appear in a small window.

To see metadata for each of these layers, left click once on the species name and a window will appear with metadata. To see the legend for each species, right click on the species name.

To select specific grid cells or survey data locations, left click once on the button with (+?) next to the species common name, then place the cursor over the map and drag a bounding box (of interest) on the map with the right mouse button. A window will appear with the specific tabular information for the selection. This selection process can be made on multiple layers if desired (by checking the Allow Multiple? box under Query Layers in the Table of Contents), with multiple tabs for each layer showing in the tabular information window. This step allows a user to more easily work with both the map representations and tabular data from downloads.

To review or download the tabular data associated with each data product, begin at the main PaCOOS website and click the Launch button under the Fish Viewer tab. Now click the Download Data link in the upper right hand corner of the view. The view will now include links to download data as MS Excel (csv) files, Adobe PDF files, and either OPeNDAP binary or ASCII Text objects. Links are available for Groundfish Survey 2003-2006, Observer Fixed Gear 2002-2006, and Observer Trawl 2002-2006, as well as other data in PaCOOS.

To review or copy and paste text from the metadata associated with each data product, begin at the main PaCOOS website and select the OPeNDAP tab. Then select the Information button under either Groundfish Survey or West Coast Groundfish Observer Program, to review the data field column descriptions and metadata text.

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT SUMMARIZING PUBLIC COMMENT RECEIVED REGARDING 2009-10 COMMERCIAL AND RECREATIONAL GROUNDFISH MANAGEMENT MEASURES

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 2009-10 groundfish fisheries (commercial and recreational). Meetings were conducted in five ports; Tillamook, Newport, North Bend, Port Orford, and Brookings. The meetings consisted of a joint session to discuss regulation setting processes and harvest levels, and break-out session to separately discuss the harvest levels and management measures specific to the recreational and commercial fisheries.

Recreational

Figures 1 and 2 detail the options submitted for the EIS. Table 1 details the waypoint locations for the various Stonewall Bank YRCA options under consideration. Table 2 is a summary of the majority opinions from each meeting as well as a listing of other comments regarding proposed recreational management measures for the 2009-10 groundfish fisheries. Overall, attendees were very concerned about the proposed low level of yelloweye rockfish impacts to be allowed and the potentially devastating reductions in season length.

Maintaining a year round season without further reductions in the marine fish bag limit was a common theme; several anglers proposed increasing the marine fish bag limit due to the expected increase in black rockfish OY. A minority of anglers supported increasing the lingcod bag limit to three fish.

Anglers in the central coast ports of Newport and Depoe Bay recommended no enlargement of the Stonewall Bank YRCA, without first adopting additional closed areas in other parts of the state. No other YRCA were recommended at the meetings.

Maintaining opportunity for flat fish inside the 40-fathom line was a concern. Permitting groundfish retention on directed halibut trips was also recommended, especially in the nearshore area.

Commercial

Nearshore Commercial Fisheries

The turnout and response concerning nearshore issues was by far the greatest among the different commercial fishery sectors. In response to yelloweye constraining the nearshore fisheries, several fishermen thought there were more yelloweye than what the stock assessment indicated. They identified the source of this discrepancy as flawed surveys, and indicated that yelloweye are not in the areas where the surveys are conducted. In addition, they felt surveys and assessments should be conducted annually in order to provide the best available data for management. Participants were also concerned about the lack of fishery dependent data in the assessment, since retention is prohibited. Among the ports, several common concerns were expressed and issues identified with regard to the proposed management measures, which are outlined below.

Area Management

The use of area management tools to address yelloweye rockfish constraints was by far the most common feedback among the ports. The respondents felt that since yelloweye rockfish populations are localized, reef or smaller area closures would be more appropriate than depth restrictions or trip limit reductions. Attendees also expressed frustration that trip limit reductions to reduce yelloweye impacts had to be implemented north of 40º10 N. lat., instead of by smaller sub-areas. According to the West Coast Groundfish Observer Program (WCGOP) data, not all sub-areas north of 40º10 N. lat. have high yelloweye rockfish bycatch rates, however the current structure does not allow for sub-area trip limit management. Furthermore, participants in Pacific City and Garibaldi pointed out that their area had the lowest yelloweye rockfish bycatch rates on the coast. Yet, under the current trip limit reduction proposal they would be just as impacted as an area with higher rates.

Depth restrictions

Moving the shoreward RCA from 30 to 20 fathoms (fm) was an acceptable management measure in most ports, with the exception of Tillamook. In areas around Tillamook, restrictions deeper 25 fm would be preferred and restrictions at 15 fm would be devastating to the fishery. Several participants expressed concern that a federal change in the RCA boundary combined with the potential for state marine reserves may result in greater loss of fishing grounds and increased gear conflicts.

Attendees also pointed out that the majority of the nearshore fishery uses jig gear, which is similar to the rod and reel gear used in the recreational fishery. Therefore, they would expect similar impacts and restrictions between the two fisheries. However, currently the recreational fleet can fish to 40 fm while the commercial nearshore fleet is constrained to 30 fm. Additionally, there are seasons where the recreational fishery can fish at all depths but the nearshore commercial fishery cannot.

Trip Limit Reductions

Respondents stated that a 30 percent reduction in trip limits would put most operations out of business. Attendees requested that the Council analyze the bycatch rates relative to the target species and, if possible, they would prefer that the reductions to trip limits be done only to those target species with the highest bycatch rates. It was speculated that bycatch rates for black and blue rockfish, which are pelagic species, would be less than for demersal target species. If this is true, participants would prefer status quo black rockfish limits, as it is a mainstay of the fishery.

Gear Restrictions

Participants expressed concern over the yelloweye rockfish impacts of longline gear. While the WCGOP data on gear specific bycatch trends were inconclusive, participants felt strongly that use and design of longline gear was directly responsible for high yelloweye rockfish bycatch. For example, during longline fishing a large number of hooks are deployed per set, compared to other hook and line fisheries. If the gear is inadvertently set in an area with yelloweye rockfish, the potential for catching a large number of yelloweye rockfish is greater. When fewer hooks are deployed (e.g., jig fishing) and yelloweye rockfish are encountered, the vessel has fewer hooks remaining in the water and can easily retrieve the gear and move locations. Most participants recommended restricting or prohibiting the use of longline gear in the nearshore. It is important to note, however, that few longline fishermen attended the meetings.

Several participants recommended that a greater number of state limited entry permits be issued for pot fishing since impacts to overfished species are fewer with this gear type. Currently, the Oregon state limited entry permit program allows for only one pot endorsement.

General Comments

The lingcod stocks are rebuilt and there is concern that the population is overly abundant and adversely affecting overfished species. Lingcod prey on juvenile rockfish and by restricting effort on lingcod we may be inadvertently harming yelloweye rockfish populations. They requested that the Council move forward with ecosystem based management in an effort to understand the predator/prey interactions of lingcod and yelloweye rockfish. They also requested an analysis of a 12 month lingcod season, similar to the Oregon recreational fishery.

Participants also requested that the WCGOP begin collecting data on the disposition of discarded fish in an effort to improve our understanding of discard mortality.

Limited Entry Bottom Trawl

Few comments regarding the bottom trawl fishery were received at the meetings; the majority came during the North Bend meeting. Three primary issues were discussed 1) the success of the selective flatfish trawl in reducing bycatch, 2) lessening impacts to darkblotched rockfish, and 3) adjustments to the shoreward RCA to provide greater access to Dover sole while reducing overfished species bycatch.

Participants noted that the selective flatfish trawl is very effective at reducing rockfish bycatch but participants are not encouraged to use the gear seaward of the RCA. For example, under the current structure, trip limits for sablefish captured with selective flatfish trawl gear are 5,000 lbs/2 months, while the limits for large and small footrope gear ranges from 14,000 to 19,000 pounds. Selective flatfish trawl gear is considered a small footrope gear, however significantly different limits are provided. Participants requested that if selective flatfish trawl gear is used seaward of the RCA, they should fall under the small footrope limits and be allowed to harvest more sablefish. If use of selective flatfish trawl gear is encouraged seaward of the RCA, participants noted that darkblotched rockfish impacts would be fewer.

Participants also requested a shoreward RCA boundary of 100 fm for periods 3, 4, and 5 (status quo is 75 fm). The deeper boundary would allow for shorter tow times, more productive fishing, and fewer overfished species impacts because populations of Dover are greater in the deep. One participant requested that a 100 fm boundary be implemented during periods 2, 3, and 5. He expressed concerned that there would be greater effort shift from the inexperienced seaward vessels during period 4, which would result in increased overfished species impacts.

Slope Fixed Gear Fisheries
Fixed gear representatives were primarily from the sablefish fishery, with a few halibut fisherman. Longline sablefish fishermen indicated a depth restriction of 125 or 150 fm would reduce yelloweye impacts and have few effects as fishing is often outside of 150 fm. However, such a restriction would affect halibut fishermen. Participants also noted the potential for increased gear conflicts if the fleet was moved deeper. Sablefish fishermen understood the reasons for switching from longline to pots, however, identified potential problems with such a move. High costs and safety were the primary deterrents. The associated costs of gear (e.g., hydraulic winch, pots, rope) may be preventative to some vessels. In addition, small vessels would not have the room or weight capacity to transition to pots. Longline fishermen may resist such a move as well since longline caught sablefish is worth more per pound and reportedly has greater catches.

Limited Entry Pacific Whiting Trawl
Few comments regarding the Pacific whiting trawl fishery were received at the meetings. Concern was expressed over salmon bycatch, increasing interactions of widow rockfish, and the proposed management measures. Attendees recommended that the Council implement vessel caps or other measures to reduce salmon bycatch in the whiting fishery. Since widow rockfish is nearly rebuilt (est. 2009), some fear it will be more difficult to stay within the bycatch limits. Participants stated that the proposed management measures are a reasonable way to address bycatch issues, however concern was expressed with options that have large fall releases. Shoreside vessels have limited ability to fish in the fall season and thus the late release would favor catcher-processors. Attendees also recommended that the Bandon Highspot, a high relief area within the trawl RCA (approximately 43º N. lat. and 125º50 W. long.), be closed to whiting trawl vessels, in order to reduce rockfish bycatch.

Figure 1. Season structure along with expected yelloweye rockfish and canary rockfish impacts for variou
2009-10 Oregon sport fishery options

<table>
<tr><th rowspan="2"></th><th colspan="12">Month</th><th rowspan="2">OR Sport Yelloweye RF (mt)</th><th rowspan="2">OR Sport Canary RF (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>1</td><td colspan="5">Open all depth</td><td colspan="4">Open <40 fm 6/1-9/30</td><td colspan="3">Open all depth</td><td>2.5</td><td>2.5</td></tr>
<tr><td>2</td><td colspan="6">Open all depth</td><td colspan="2"><40 fm 6/20-8/31**</td><td colspan="4">Open all depth</td><td>2.5</td><td>2.6</td></tr>
<tr><td>3</td><td colspan="3">Open all depth</td><td colspan="6"><40 fm 4/1-9/30</td><td colspan="3">Open all depth</td><td>2.2</td><td>2.3</td></tr>
<tr><td>4</td><td colspan="12">Open <40 fm</td><td>2.0</td><td>2.2</td></tr>
<tr><td>5</td><td colspan="12">Open <30 fm</td><td>1.8</td><td>2.0</td></tr>
<tr><td>6</td><td colspan="4">CLOSED</td><td colspan="5">Open <25 fm 5/1-9/30</td><td colspan="3">CLOSED</td><td>1.6</td><td>1.7</td></tr>
</table>

Figure 2. Stonewall Bank YRCA options (located approximately 15 miles out of Newport).

Stonewall Bank - Yelloweye Rockfish Conservation

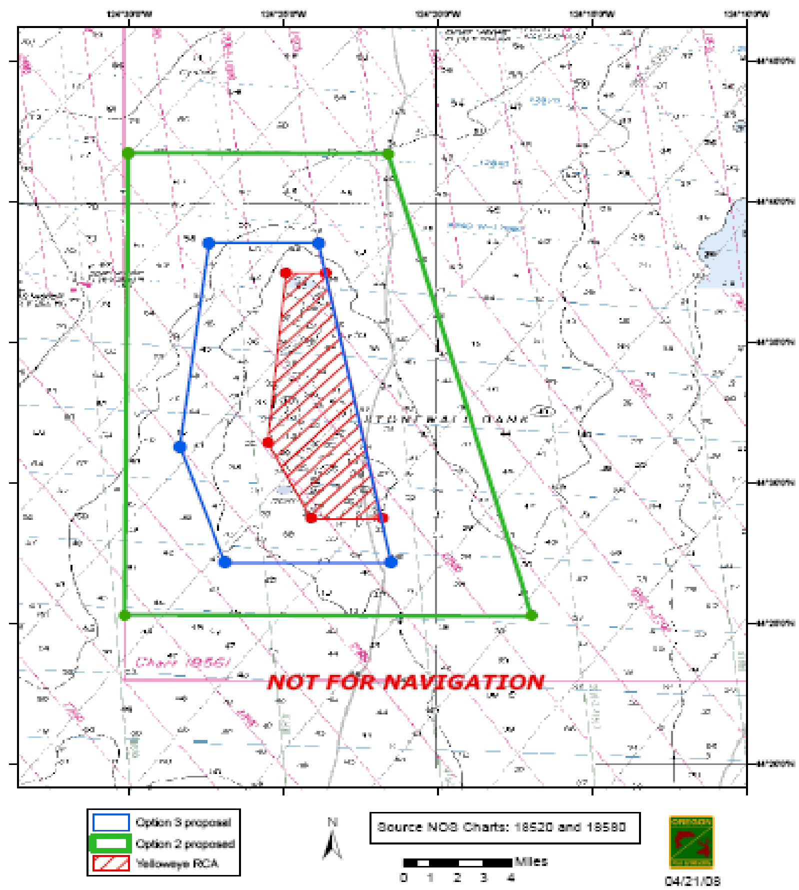


Table 1. Waypoints for the three Stonewall Bank YRCA options

Existing Stonewall Bank YRCA

N Latitude			Longitude	
Degrees	Minutes		Degrees	Minutes
44	37.4580		-124	24.9180
44	37.4580		-124	23.6280
44	28.7100		-124	21.7980
44	28.7100		-124	24.1020
44	31.4220		-124	25.5000

Stonewall Bank Option 2 (largest area)

N Latitude			Longitude	
Degrees	Minutes		Degrees	Minutes
44	41.7594		-124	30.0180
44	41.7348		-124	21.6030
44	25.2456		-124	16.9440
44	25.2942		-124	30.1404
44	41.7594		-124	30.0180

Stonewall Bank Option 3 (medium area)

N Latitude			Longitude	
Degrees	Minutes		Degrees	Minutes
44	38.5440		-124	27.4122
44	38.5440		-124	23.8554
44	27.1320		-124	21.5010
44	27.1320		-124	26.8944
44	31.3020		-124	28.3476

Table 2. Major Sport Issues Discussed at Public Meetings reviewing 2009-10 Management Measures *

	Brookings	North Bend	Newport	Tillamook
Number of Sport Public Participants	~15	~20	~10	~15
Issues:				
Confirm: year round fishery at expense of offshore opportunity and reduced marine bag limit	Majority supported year round fishery	Majority supported year round fishery over increasing the bag limit	Majority supported year round fishery	Split opinion. Best opportunity for Garibaldi is between March and November.
Lingcod bag limit	Majority supported 2 fish	Majority supported 3 fish. Concern was expressed about lingcod predation on rockfish.	Split opinion. Participants favored 2 or 3 fish. Concern expressed over bycatch of "other nearshore" rockfish species, especially quillback.	Majority supported 2 fish
Marine bag limit (rockfish, greenling, cabezon, etc.)	Majority supported status quo (6 fish)	Majority wanted an increase in the bag limit (range 7 to 10). Possible sub-bag for "other nearshore rockfish"	Majority wanted an increase in the bag limit (range 7 to 10). Possible sub-bag for "other nearshore rockfish" and also possibly allow some "red fish" retention	Majority supported an increase to 8 fish (and keep it at that level for several years). Possibly allow 1 canary RF retention.
Reduce Pacific halibut season to achieve longer groundfish season	Yes, as the south coast is penalized since it has no P. halibut to target.	No, but a two halibut daily bag limit may reduce rockfish impacts.	Against voluntarily reducing the halibut season as we will never get the allocation back (someone else will take it).	No support for a voluntary reduction.
Enlarge Stonewall Banks YRCA	No comments as discussion focused on general halibut fishery.	Some support for a larger Stonewall Banks YRCA.	No support for enlargement of the area as there was concern it would prevent possible future yellowtail target opportunities. Would rather see other areas of the state establish YRCA's.	Not much comment as it is not in "our" area
Other Related Proposals/ Issues	1. A few anglers supported annual limits on rockfish and lingcod (tags?) 2. Regional mgt within OR on nearshore species.	1. Allow incidental take of lingcod in the all-depth P. halibut fishery. 2. Regional mgt within OR. 3. Do not support increased allocation of yelloweye RF to California.	Concern was expressed about obtaining the "other nearshore rockfish" annual limit and the possibility it may close the nearshore boat fishery.	Prefer open for groundfish in all-depths in September rather then May as many anglers are fishing halibut in May

* 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.

Other Sport Fishery comments received at the meetings or through individual calls

1. A common concern heard in the ports was that they were not the yelloweye RF problem and that the fishery should be managed regionally (the underlying assumptions was that opportunity would increase in that area).
2. Allow flat fish opportunity out to 40-fathoms year round. Adopt hook size restrictions if necessary.
3. Allow halibut anglers to return shoreside of 40-fathoms and retain groundfish as the lingcod and black rockfish status has improved and exceeding the annual catch limit is no longer a concern.
4. Would like any remaining HG added to the next years HG.
5. The yelloweye rockfish allocation should be based on the stock status in each state. California should not see an increase in allocation over 2007-08 as the stock is less than 10% of unfished abundance compared to 20% for Oregon and Washington.
6. There are isolated locations with an overabundance of yelloweye - so let anglers keep yelloweye at those spots.
7. Allow catch and release in the nearshore area rather than total closures.
8. Most anglers don't know what "red" fish can be kept and thus reported releases of yelloweye and canary are over estimates.
9. Close the spring to lingcod.
10. Concern about California anglers fishing in Oregon due to lost opportunity in their state.
11. Adopt a selective fishery for lingcod.
12. Several participants questioned why the lingcod minimum size was reduced from 24-inches to 22-inches (not supported).
13. Why close outside of 100 fathoms? The commercial hook-and-line fishery is open outside 100 fathoms.
14. Do not yet California overages close the Oregon fishery.
15. A 10 fish bag limit (8 marine fish and 2 lingcod) is an attractive sell.
16. Canary rockfish are abundant and anglers should be allowed to keep at least one.
17. If Stonewall Bank area enlarged it should only apply to the halibut fishery, do not take away anymore offshore groundfish opportunity off Newport.
18. Keep spring break open for groundfish.
19. Allow 1 "red fish" retention as it would provide information on status of yelloweye and canary rockfish.
20. Close nearshore over the winter, but leave offshore open.
21. Increase the halibut daily bag limit to two fish.

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT ON THE TENTATIVE ADOPTION OF THE 2009-2010 RECREATIONAL GROUNDFISH FISHERY SPECFICATIONS AND MANAGEMENT MEASURES

Advice from the Oregon Sport Advisory Committee

The Oregon Department of Fish and Wildlife (ODFW) met with members of its Sport Advisory Committee (SAC) on May 28, 2008 to discuss the proposed management measures for the 2009-2010 Oregon recreational groundfish fishery. As an advisory, SAC provides management advice 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 port commissions. Membership is distributed coastwide in an effort to have representation of each of the coast areas and includes members from inland areas along the Willamette Valley and areas south.

At this meeting, ODFW staff summarized the Council preferred harvest levels for species that constrain the Oregon sport groundfish fishery (primarily yelloweye, canary and black rockfish) 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 late April and early May were also detailed (Agenda Item F.4.b;ODFW Report), and the same questions posed to the public in those meetings were asked of SAC. A schematic of the management measures provided for the EIS is provided for reference in Figure 1. The following summary represents the consensus opinions of SAC:

1. Do you prefer a year round season to a short season which has less offshore closures and a larger marine bag limit?

   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 the importance of season length versus bag limit as witnessed by the state imposed 6-fish marine daily bag limit in place since 2006 (the marine bag is primarily composed of rockfish, greenlings and cabezon). In past SAC meetings they advised against adopting a bag limit less than 5-fish.

2. How many fish do you recommend for the lingcod daily bag limit?

   SAC members discussed the desirability of being able to adjust the lingcod bag limit inseason to 3-fish if either the Pacific halibut quota or the marine bag limit is reduced. They recommended adopting a 3-fish bag limit under federal regulations and a 2-fish bag limit under state rule to start out the 2009 season. They also discussed the desirability of allowing the retention of lingcod taken incidentally in the directed halibut fishery.

3. How many fish do you recommend for the marine daily bag limit?

   The unanimous preference for SAC was 10-fish if the bag limit does not restrict the year long season duration. SAC members were aware of the recent black rockfish stock assessment and likely increase in OY. SAC noted that Oregon has had the lowest limit in the rockfish bag limit of any state under Pacific Fishery Management Council jurisdiction. They recommended adopting a 10-fish bag limit under federal regulations to allow flexibility to increase the bag inseason if a lower limit is adopted under state rules.

4. Should the Pacific halibut season catch limit be voluntarily reduced so as to free up yelloweye rockfish impacts for the groundfish fishery?

   SAC members indicated a strong preference for not voluntary reducing the allowable harvest of Pacific halibut in the Oregon recreational fishery. They indicated that if the International Pacific Halibut Commission reduced the catch available to Area 2A then the groundfish season should be liberated in some fashion to help counter the negative economic effect (i.e., increased lingcod bag limit, more offshore groundfish opportunity, maintain year round season, etc.).

5. Should the Stonewall Bank Yelloweye Rockfish Conservation Area (YRCA) be increased in size?

   The advice from SAC was not to increase the size of the Stonewall Bank YRCA at this time. They felt the present size of the YRCA was already very disruptive to the groundfish and halibut fishery out of Newport. Concern was expressed that if the YRCA area is increased the potential may be lost for future opportunity to target yellowtail rockfish in the event that gear is developed to allow a targeted fishery, while avoiding yelloweye rockfish encounters. There was great support expressed for allowing the test fishery proposed at the June Council meeting by Wayne Butler and John Holloway (Agenda Item F.3.a. Attachment 4).

Input received during the public meetings included a proposal to allow targeting of sanddab shoreside of 40-fathoms. The 2008 regulations allow for this fishery as the groundfish fishery is open shoreside of 40 fathoms. The options for the 2009-10 Oregon groundfish fishery include offshore closures starting at 25 and 30 fathoms. The request was discussed with SAC and they recommended the sanddab fishery be allowed out to 40 fathoms even if the offshore closure of the groundfish fishery is at a fathom line less than 40 fathoms. They recommended the retention of sanddab and “other flatfish” be exempt from season and depth restrictions.

Figure 1. Season structure along with expected yelloweye rockfish and canary rockfish impacts for various 2009-10 Oregon sport fishery options (shore based fisheries open year round)

	Month J F M A M J J A S O N D	OR Sport Yelloweye RF (mt)	OR Sport Canary RF (mt)	Marine Bag Limit *	Lingcod Bag Limit
1	Open all depth; Open <40 fm 6/1-9/30; Open all depth	2.5	2.5	6	2
2	Open all depth; <40 fm 6/20-8/31**; Open all depth	2.5	2.6	6	2
3	Open all depth; <40 fm 4/1-9/30; Open all depth	2.2	2.3	8	2
4	Open <40 fm	2.0	2.2	10	2
5	Open <30 fm	1.8	2.0	10	2
6	CLOSED; Open <25 fm 5/1-9/30; CLOSED	1.6	1.7	10	3
7	Same as option 1, but with a 1 canary rockfish sub bag limit	2.5	10.4	6	2

* Marine fish bag limit includes rockfish, greenling, cabezon and other species excluding lingcod, flat fish, Pacific halibut, salmon, trout, steelhead, perch, sturgeon, striped bass, offshore pelagic species, and bait fish (herring, smelt, anchovies and sardines). Retention of yelloweye rockfish and canary rockfish are prohibited.
** Assumes a 50% reduction in Pacific halibut catch from 2009 levels.

Agenda Item F.4.b
Supplemental ODFW Report 3
June 2008

Oregon Preliminary Preferred Alternative

Oregon proposes Alternative 5, the 17/17mt option for yelloweye rockfish with a 2005 sharing agreement.

<table>
<tr><th rowspan="2">Groundfish Sector</th><th colspan="3">17 mt</th></tr>
<tr><th>2005 Sharing (mt)</th><th>2008 SQ</th><th>OR Preferred</th></tr>
<tr><td>LE Non-Whiting Trawl</td><td>0.3</td><td>0.6</td><td rowspan="2">0.5</td></tr>
<tr><td>LE Whiting Trawl</td><td>0.3</td><td>0</td></tr>
<tr><td>LE Fixed Gear</td><td>1.9</td><td>2.2</td><td rowspan="2">2.5</td></tr>
<tr><td>Directed OA</td><td>0.5</td><td>2</td></tr>
<tr><td>WA Rec</td><td>2.7</td><td>3.5</td><td>2.7</td></tr>
<tr><td>OR Rec</td><td>2.5</td><td>3.3</td><td>2.5</td></tr>
<tr><td>CA Rec</td><td>2.8</td><td>2.1</td><td>2.8</td></tr>
<tr><td>Total</td><td>11</td><td>13.7</td><td>11</td></tr>
</table>

Oregon requests that the groundfish management team conduct the following analyzes for Thursday’s check in:

- Whiting Trawl Fisheries: Analyze how much, if any, yelloweye rockfish should be set aside for the whiting trawl fishery based on the latest data.
- Non-Whiting Trawl Fisheries: Analyze management measures based on a yelloweye rockfish impact of 0.5 mt.
- Nearshore commercial fisheries: Analyze a range of management measures for the nearshore fishery with yelloweye rockfish impacts between 0.5 mt and 1.0 mt.

Rationale for the Yelloweye Rockfish Ramp down:
As shown by Dr. Punt’s analysis (Agenda Item F.4.a., Supplemental Attachment 3), the rebuilding consequences of maintaining an OY of 17 mt for yelloweye rockfish in 2010 are slight. The Median Year to Rebuild is extended by 0.1 years. The probability of rebuilding by the current target of 2084 is reduced by 0.2%.

QUILEUTE

Quileute Natural Resources
QUILEUTE INDIAN TRIBE

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Testimony of Mel Moon in Support of Tribal Request for Whiting Allocation

As the National Marine Fisheries Service ("NMFS") and the Pacific Fishery Management Council ("PFMC") are well aware, the Quileute Indian Tribe intends to participate in the Pacific whiting fishery commencing in 2009. Since late 2007, the Tribe has made its intentions clear, both in writing and orally, to NMFS and the PFMC. The Tribe is here today to again reiterate its intention to participate in the 2009 Pacific whiting fishery and, more specifically, to support the Makah Tribe's request for an increase in the tribal whiting allocation to 20.5% of the United States Optimum Yield ("OY").

As you know, the Secretary of Commerce, through NMFS, has issued regulations allocating whiting to the coastal tribes since approximately 1996. The Quileute Tribe has not previously participated in this fishery. In 2009, however, one or more Quileute members intend to participate in this fishery. The Tribe informally advised NMFS of its intent to enter this fishery at the last PFMC meeting in November, 2007. By letter dated January 10, 2008 and pursuant to 50 C.F.R. § 660.324(d), the Quileute Tribe formally provided NMFS with written notification of its intent to participate in the Pacific whiting fishery commencing in 2009. By reply letter dated April 2, 2008, NMFS advised the Tribe that its request had been forwarded to the PFMC for consideration at its April meeting. At that time, NMFS advised that "any whiting allocation will be an overall tribal allocation, and the intertribal distribution of the overall tribal allocation is an intertribal issue." At the April 2008, PFMC meeting, the Tribe again reiterated its intent to participate in the 2009 Pacific whiting fishery.

Subsequently, the Quileute Tribe has met in good faith with other coastal tribes and NMFS to further discuss the specifics of the coastal whiting fishery. Specifically, on May 2, 2008, representatives of the Quileute, Makah, and Quinault tribes met with representatives of NMFS to discuss the tribal whiting fishery. At that time, and pursuant to NMFS's request, the Quileute Tribe provided additional information about the nature and scope of its anticipated 2009 whiting fishery. Specifically, Quileute:

(1) Anticipated one vessel between 95 – 125 feet to participate in the 2009 whiting fishery,

(2) Estimated a whiting harvest of approximately 4,000 to 8,000 metric tons based on historical catches of similarly sized vessels,

(3) Indicated that its whiting fishery would take place between May 15-December 15, 2009 for catcher/processor or "mothership", and June 15-December 15, 2009 for shore-based delivery.

(4) Provided estimates of its bycatch based upon the groundfish management team's weighted average approach;

(5) Stated that it would be working with the NOAA staff and regional science center for time and area management measures to minimize bycatch in the Quileute whiting fishery.

Subsequent to this meeting, the Quileute, Quinault, and Makah tribes engaged in further discussions about the 2009 whiting fishery. At that point, the Quinault tribe made clear that it would not be participating in the whiting fishery until at least 2010. Thereafter, the Quileute and Makah tribes agreed that the total tribal allocation for 2009 should be 20.5% of the OY, which represents a 3% increase on the maximum amount of the prior tribal allocation under the "sliding scale" approach. Accordingly, the Quileute Tribe hereby supports the Makah's request for a total tribal allocation of 20.5% to meet the needs of the Quileute and Makah Tribes who will be participating in this fishery in 2009. Considering that the best available science shows that all harvestable whiting pass through the Quileute and Makah U&As, this amount is clearly well-within their treaty right to harvest up to 50% of the OY.

Although the Quileute and Makah tribes agree upon the total tribal whiting allocation for 2009, they are continuing to negotiate over the proper intertribal distribution of that allocation. To be clear, however, any tribal whiting allocation must be made to the coastal tribes as a whole, and must not be split-up by tribe or made to any specific tribes. In all of its discussions with NMFS, PFMC, and other tribes, the Quileute Tribe has been very clear that NMFS must, as it has in every prior year and in every other federally managed fishery, make a ***total tribal whiting allocation*** and must not take the unprecedented step of allocating groundfish on a tribe-by-tribe basis. Tribal allocations of all federally-managed fisheries, including Pacific whiting, have always been made to ***all coastal tribes***, leaving it up the tribes to decide the appropriate intertribal distribution. The federal regulations make clear that once NMFS receives a tribal request to participate in a groundfish fishery, as it has here, it must implement that right "through an allocation of fish **that will be managed by *the tribes*...** ." 50 C.F.R. § 660.324(d) (emphasis added). In other words, it is up to the tribes to decide how to manage a total tribal groundfish allocation. NMFS could not have been more clear on this point in 1999 when it stated in federal regulations that: **"NMFS believes that the intertribal distribution of the overall tribal allocation is an internal tribal issue, and herein issues only a total allocation for the affected tribes."** 64 Federal Register 27,929 (May 24, 1999) (emphasis added). The Quileute Tribe would strenuously object to issuance of any "separate allocation" to the Quileute or any other action which purports to restrict Quileute's right to harvest from the overall "tribal allocation."

Last, the Quileute Tribe's participation in the whiting fishery will not result in the excessive harvest of overfished species. First, the Quileute Tribe intends to model its observer and bycatch-avoidance programs after those successfully implemented by the

Makah Tribe. The Quileute Tribe continues to research and study those programs and looks forward to working with the Makah tribe to better understand its processes. The Quileute Tribe is confident that by the time it commences this fishery nearly one year from now that it will have an adequate observer program and other steps to minimize bycatch, such as time and area restrictions. Second, although new to this fishery, Quileute fishermen are responsible and very experienced in other fisheries. They have a proven track record of successfully minimizing bycatch in other fisheries, such as halibut and blackcod. Third, there is no evidence suggesting that the Quileutes's U&A is home to higher concentrations of sensitive or protected species of groundfish. To the contrary, analysis of variance (or ANOVA) studies of the bycatch rates for overfished species for the years 2003 to 2007 for the non-tribal at-sea fleets showed no significant differences in the concentration of overfished species between the various tribal U&As.

In short, the Quileute Tribe hereby joins and supports the Makah Tribe's request for a total tribal whiting allocation in 2009 of 20.5% of the OY. This represents a relatively minor increase to the total tribal allocation and remains well-within the treaty right.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE RESPONSE TO CALIFORNIA DEPARTMENT OF FISH AND GAME (CDFG) REPORT ON YELLOWEYE ROCKFISH RECREATIONAL HARVEST GUIDELINE CATCH-SHARING OPTIONS

In response to the California Department of Fish and Game's report (Agenda Item F.4.b, CDFG Report), the Washington Department of Fish and Wildlife would like to offer the following corrections:

1. p. 2 – Fishery Sector Apportionment: All fisheries are affected by the adopted OY—we strongly disagree that tribal, open access, research, and exempted fishing permit set asides (unchangeables) are to be held harmless from restrictions. We acknowledge that the Council has limited ability to affect research catch; however, the other three fisheries are subject to Council management and considered along with all sectors that impact a particular species of concern.

2. p. 4 – Table 1. The combined Oregon and Washington harvest guideline for yelloweye rockfish in 2005 was 6.7 mt (the same as it was in 2006), not 9.4 mt.

3. p. 4 – California Recreational Catch Projection Methodology: As noted on pages 2 and 3, the recreational total in 2005 and 2006 was 10.4 mt, and the recreational total in 2007 and 2008 is 8.9 mt. While California's "share" of the recreational total decreased, the reference to "California…relinquished…their 2006 yelloweye rockfish recreational HG to the other states to minimize the need for further reductions in Oregon and Washington's recreational fisheries management strategy in 2007-2008" is incorrect and misleading.

   In reviewing the amount of the recreational component of the total, the total estimated mortality (not the OY) must be taken into account (Table 1).

   Table 1. Yelloweye rockfish catch estimate summary, 2005-08.

Year	Recreational HG Total	Non-Tribal Commercial	Research	Total Est Mortality	OY	Residual
2005	10.4	6.2	1.0	21.3	26	4.7
2006	10.4	6.0	2.0	21.1	27	5.9
2007	8.9	5.5	2.0	18.5	23	4.5
2008	8.9	5.9	3.0	18.9	20	1.1

   The recreational component of the overall total has decreased since 2005 and 2006 (Table 2), whereas the commercial and research components have increased; therefore, it's incorrect to state that the California recreational reduction of 1.6 mt (from 3.7 – 2.1) went to Oregon and Washington recreational fisheries.

Table 2. Percentage of yelloweye rockfish catches, by fishery, 2005-08.

Year	% of Total		
	Recreational	Non-Tribal Commercial	Research
2005	48.8%	29.1%	4.7%
2006	49.3%	28.4%	9.5%
2007	48.1%	29.7%	10.8%
2008	47.1%	31.2%	15.9%

It would be correct to state that the 1.6 mt of yelloweye rockfish previously assigned to the California recreational fishery was distributed among other non-recreational fisheries, including directed commercial fisheries and research catch, and contributed to the overall amount of residual.

4. p. 9 and p. 11 – Analysis of Recreational Catch Sharing Alternatives: The reference to Washington having a year-round season is grossly misleading. Given the weather and rough water conditions off Washington's coast, particularly in the winter (and oftentimes spring) months, in reality, Washington's recreational fishery is, at best, seven months long (mid-March through mid-October) in Catch Areas 1, 2, and 3, which is consistent with the lingcod season. In Catch Area 4, this season is reduced by a month, as lingcod does not open until mid-April. In addition, nearly every charter boat's insurance policy has a lay-up provision extending from October 15th through March 15th.

In addition to these corrections and clarifications, WDFW would like to point out that the California recreational harvest guidelines for 2007 and 2008 were based on the projected impacts resulting from the California recreational impact model developed and presented by CDFG. None of the other government entities, including the tribes, and the Washington and Oregon Departments of Fish and Wildlife, or any of the fishery sectors advocated reducing the amount of the California recreational harvest guideline for 2007 and 2008; the guideline was set at the level recommended by CDFG.

For CDFG to identify Washington and Oregon recreational fisheries as the source to provide additional yelloweye rockfish for the California recreational fisheries by presenting options that only focus on reapportionment within the recreational total, especially when those fisheries did not benefit from the yelloweye that California gave up, is shortsighted.

Washington does not have a nearshore directed commercial fishery where, according to the scorecard, 1.6 mt of yelloweye are harvested. We closed state waters to the directed hook-and-line fishery beginning in 1996, and prohibited the live fish fishery in 2000. Instead of taking yelloweye in a nearshore commercial fishery, Washington has instead reserved its nearshore stocks for recreational harvest.

However, in spite of our concerns with the manner in which CDFG has represented this issue, WDFW recognizes that we are all in this together and we need to cooperatively adopt measures to reduce our overall estimated yelloweye rockfish impacts to ensure we stay within the rebuilding annual catch limit. In that spirit of cooperation, we have developed a preliminary preferred alternative for the Washington recreational fishery for the Council's consideration (Agenda Item F.4.b, WDFW Report 2).

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE PRELIMINARY PREFERRED MANAGEMENT MEASURES FOR 2009-2010 RECREATIONAL FISHERIES

The Washington Department of Fish and Wildlife (WDFW) held public meetings on December 14, 2007, February 14, 2008, March 18, 2008 and April 22, 2008 to develop and discuss recreational bottomfish proposals for 2009 and 2010. Based on these discussions, WDFW developed the preliminary preferred alternative for 2009 and 2010 described below. The intent of the preferred alternative is to reduce incidental catch of overfished rockfish, primarily yelloweye, while anglers are targeting halibut and lingcod. Depth restrictions are used to keep the fishery focused in shallower water (i.e., 20 fathoms or less), which is expected to increase survivability of released rockfish based on research by Albin and Karpov (1995). There is also expected to be a reduced encounter rate of yelloweye rockfish in shallower depths (i.e., 30 fathoms or less).

2009-2010

Lingcod

Marine Areas 1-3, open Saturday closest to March 15 through the Saturday closest to October 15
Marine Area 4, open April 16 through the Saturday closest to October 15, or October 15th if the Saturday closest to October 15th falls later than October 15th

Bottomfish

For all areas in 2009-2010 continue to prohibit the retention of yelloweye and canary rockfish. Prohibit fishing for, retention or possession of bottomfish and halibut in the C-shaped yelloweye rockfish conservation area in the north coast and the two offshore rockfish conservation areas in the south coast area.

Bag Limits

For both 2009 and 2010, the aggregate bottomfish bag limit is 15, which includes a sub-limit of 10-rockfish and 2-lingcod but does not include halibut.

2009

North Coast (Marine Areas 3 and 4)

Prohibit the retention of bottomfish seaward of a line approximating 20 fathoms from May 21-September 30, except on days that halibut fishing is open.

South Coast (Marine Area 2)

Prohibit the retention of bottomfish seaward of a line approximating 30 fathoms from March 15-April 30.
Prohibit the retention of bottomfish, except sablefish and Pacific cod seaward of a line approximating 30 fathoms from May 1-June 15.
Prohibit the retention of lingcod south of 46°58 on Fridays and Saturdays from July 1 through August 31

Columbia River (Marine Area 1)

Prohibit the retention of bottomfish, except sablefish and Pacific cod, with halibut onboard from May 1 through September 30.

2010

North Coast (Marine Areas 3 and 4)

Prohibit the retention of bottomfish seaward of a line approximating 20 fathoms from (the start of the halibut season) May 12- September 30, except on days that halibut fishing is open.

South Coast (Marine Area 2)

Prohibit the retention of bottomfish seaward of a line approximating 30 fathoms from March 15-April 30.

Prohibit the retention of bottomfish, except sablefish and Pacific cod seaward of a line approximating 30 fathoms from May 1-June 15.

Prohibit the retention of lingcod seaward of 30 fathoms south of 46°58 July 1 through August 31

Columbia River (Marine Area 1)

Prohibit the retention of bottomfish, except sablefish and Pacific cod, with halibut onboard from May 1 through September 30.

Based on the Washington recreational impact model, the estimated mortalities for canary and yelloweye rockfish are projected to be:

	Yelloweye mt	Canary mt
2009	2.5	1.2
2010	1.9	0.7

As these projected impacts are less than the proposed Washington recreational harvest targets for canary and yelloweye, WDFW believes these management measures will provide recreational harvest opportunity while achieving rebuilding targets. WDFW will track the Washington recreational catch inseason and will take action as appropriate, to ensure these targets are not exceeded.

GROUNDFISH ADVISORY SUBPANEL REPORT ON TENTATIVE ADOPTION OF 2009-2010 GROUNDFISH HARVEST SPECFCIATIONS, MANAGEMENT MEASURES, AND REBUILDING PLAN REVISIONS

The Groundfish Advisory Subpanel (GAP) has the following comments on harvest specifications issues:

1. Ramp Down Strategy for Yelloweye

The GAP believes there is reasonable justification for altering the current ramp-down strategy for yelloweye. Specifically, the analysis indicates that maintaining a 17 mt optimum yield (OY) for 2009 and 2010 has negligable biological impacts on the stock. However, maintaining 17 mt for two more years has significant economic benefit compared to ramping down to 14 mt in 2009.

2. Yelloweye Catch-sharing

The majority of the GAP does not support revisiting catch sharing for yelloweye rockfish between the commercial and recreational sectors. The GAP is clearly divided over reapportioning yelloweye between the recreational sectors, and these divisions represent an Oregon and Washington position not to take action versus a California position to reapportion the catch.

3. Widow Rockfish Acceptable Biological Catch (ABC)/OY

The GAP reiterates our recommendation to set the widow rockfish OY at the current spawning biomass per recruit (SPR) harvest rate, which provides a 2009 OY of 522 mt which equates to 6 percent of the 2009 ABC (7,728 mt). The health and increasing abundance of the widow stock has been consistently validated over the past several assessment cycles. It is likely the stock will be above B40 before 2009 management measures are implemented. It is clear to the GAP that the widow rockfish resource can easily support the current harvest rate. Given their increasing abundance, it is certain that widow rockfish will be encountered at higher rates in many sectors of the groundfish fishery. Maintaining the current harvest rate will provide flexibility to the Council in balancing widow rockfish impacts in the scorecard. Even a 522 mt OY, which is based on the current harvest rate, will potentially limit the whiting fishery to less then 300,000 mt.

4. Sablefish in the Conception Area

The GAP recommends adopting a coastwide OY for 2009 of 8,423 mt distributed 7,723 mt to the north and 700 mt south of 36°. This split more closely reflects the current fishery and status quo apportionment until there is more information to suggest otherwise. Further, as a precautionary measure an OY of 8,423 mt is only 85 percent of the ABC, whereas in 2008 the OY was 98 percent of the ABC. Regardless of the split the GAP recommends a coastwide OY of 8,423 mt.

5. Longnose Skate

The GAP agrees with the Scientific and Statistical Committee (SSC) and Groundfish Management Team (GMT) to manage skates separately from the other fish category.

6. Blue Rockfish

The GAP is supportive of Blue rockfish remaining in the minor nearshore complex and not being managed under a separate ABC/OY.

PFMC
6/9/08

GROUNDFISH MANAGEMENT TEAM REPORT ON TENTATIVE ADOPTION OF 2009-2010 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES

At its April meeting the Council adopted acceptable biological catches (ABCs) and a range of optimum yields (OYs) including preliminary preferred OYs for groundfish species and complexes for analysis. These harvest specifications are included in the Preliminary Draft Environmental Impact Statement (EIS) in Tables 2-1a and 2-1b (Agenda Item F.4.a, Attachment 1).

Under this agenda item, the Council is scheduled to adopt final preferred OYs for depleted species, adopt rebuilding plan revisions for selected depleted species, and provide guidance on management measures for 2009-2010 fisheries.

The Groundfish Management Team (GMT) discussed revised rebuilding analyses, the preliminary preferred OYs adopted at the April meeting and their management implications and has the following comments:

HARVEST SPECIFICATIONS

Yelloweye

In April, the Council requested that National Marine Fisheries Service (NMFS) run a rebuilding analysis based on a yelloweye rockfish OY of 17 mt for both 2009 and 2010 (yelloweye OY Alternative 5). The GMT's report on the issue stated that the 17 mt OY in 2010 would likely have short-term benefit to communities but that the preliminary rebuilding analysis of the 17 mt OY suggested that it would result in "lower harvest levels after the ramp-down is complete." (Agenda Item H.7.c, Supplemental GMT Report, April 2008).

The analysis of the alternative ramp-down strategy is provided in Agenda Item F.4.a, Supplemental Attachment 3. In sum, the analysis estimates that a 17 mt OY in 2010 would delay the median year to rebuild the stock by 0.1 years compared to a 2010 OY of 14 mt if the constant harvest rate is set at a 71.9 percent spawning biomass per recruit (SPR) harvest rate in 2011. The analysis also shows that there would be no delay relative to the status quo ramp down strategy if the SPR is set at the slightly lower SPR harvest rate of 71.94 percent instead of 71.9 percent. Although it is unlikely that harvest rates can be controlled to this level of accuracy, this slightly lower harvest rate would equate to a 0.02 mt reduction in the OY in 2011 and 2012 and an increase in the probability of rebuilding by T_{target} from 54.7 percent to 55.0 percent (compared to a 2010 OY of 14 mt and constant SPR of 71.9 percent).

Current Federal regulations state that, "Yelloweye rockfish is subject to a ramp-down strategy where the harvest level will be reduced from current levels until 2011 [at which time the stock] will be subject to a constant harvest rate strategy with a constant SPR harvest rate of 71.9 percent." This constant harvest rate beginning in 2011 is a key feature of the yelloweye rebuilding plan and represents the Council's primary decision on how to rebuild the stock in "as short [a time] as possible, taking into account the needs of fishing communities."

The four year ramp-down period is an additional feature of the rebuilding plan designed to mitigate the negative community impacts of an immediate transition to the constant harvest rate. It was described in the record of decision as a transition period for both management and industry to learn how to manage to the highly restrictive harvest levels needed to rebuild yelloweye and to collect additional fishery independent information that could be used to improve the data-poor stock assessment. The GMT notes that a 17 mt OY in 2010 would require a more abrupt adjustment on the part of management and industry to the constant harvest rate in 2011. Although the original ramp-down analysis was done assuming an OY of 14 mt in 2010, an OY of 17 mt in 2010 does not significantly alter the rebuilding schedule. Moreover, recent information shows that bycatch of yelloweye is higher in several fisheries than previously thought (including the bottom trawl fishery and the California recreational fishery), meaning that a lower yelloweye OY in 2010 will have larger implications to fisheries and communities than previously thought.

Finally, the GMT notes that management measures for the 2009–2010 will be heavily influenced by the yelloweye OY. To facilitate development and analysis of management measures for Agenda Items F.7 and F.9, the GMT believes it is necessary to adopt final OYs under this agenda item and to provide guidance on yelloweye rockfish catch sharing scenarios for analysis.

Widow and Darkblotched Rockfish

The Council's preliminary preferred OY for darkblotched rockfish was chosen because of the importance of the stock to the groundfish trawl sectors. Darkblotched is highly limiting to the trawl fisheries because it co-occurs with the most economically important species in the fishery such as petrale sole, sablefish, and whiting. The previous EIS estimated that a "no darkblotched fishing" scenario would result in total exvessel value losses of $64.6 million, including $14.3 million for the non-whiting trawl sector and $27.1 million for the whiting sector.[1] In addition, darkblotched appears to restrict exvessel revenues in the trawl fisheries more than other species such as canary. The GMT estimated those sectors lose 6 percent in exvessel revenues for a 1 percent reduction in darkblotched bycatch. It would take a 14 percent reduction in canary bycatch to equal that same rate of revenue loss.

The Council's integrated rebuilding strategy under Amendment 16-4 centers on pushing fishing effort off of the more sensitive rebuilding species and on to the less sensitive rebuilding species (i.e., off of species with longer rebuilding times and onto species able to rebuild quicker). This concept was recommended as the best way of taking into account the biology of the stocks and the needs of fishing communities in a programmatic fashion that simultaneously considered all rebuilding species and groundfish sectors. The GMT still recommended this as the best approach for balancing "short as time as possible" with the "needs of fishing communities."

During the development of this concept, darkblotched rockfish was identified as a less sensitive rebuilding species, implying that the OY on darkblotched rockfish be set high relative to more sensitive species such as yelloweye. However, the results of the most recent darkblotched rockfish assessment recategorize darkblotched rockfish as more sensitive to harvest levels. The best available estimates of the biology and status of darkblotched now predict an expected time

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[1] *See* Table 7-69 in the "Final Environmental Impact Statement (FEIS) for the Proposed ABC/OY Specifications and Management Measures for the 2007-2008 Pacific Coast Groundfish Fishery / Amendment 16-4 to the Groundfish FMP." The estimates were calculated for both "no fishing" on darkblotched and POP. Given the co-occurrence of the two species, no fishing on one stock would effectively end fishing on the other.

to rebuild of 2018 if fishing mortality on darkblotched ceased in 2009 (i.e., $T_{F=0}$)[2]. The expected time to rebuild under the Council's preliminary preferred alternative is 2030 (i.e., T_{Target}).

On the other hand, the rebuilding year for widow rockfish is less sensitive to changes in harvest levels. For example, the widow rockfish OY could be set at considerably higher levels and still result in a rebuilding year of 2009 – the same year as if no catch of widow were to occur.

At the March 2008 Council meeting, the GMT identified a relationship between widow rockfish and darkblotched rockfish in the whiting fishery. In order to avoid darkblotched rockfish, the whiting industry has prosecuted opportunities in a manner that increased widow rockfish impacts and vice versa.

Although this relationship between widow and darkblotched is still uncertain, the GMT notes that the Council could consider lowering the darkblotched OY even further than the preliminary preferred alternative and balance it with an increase in the widow rockfish OY. In other words, the needs of fishing communities might be similarly met, and the estimated time to rebuild for darkblotched decreased, by reducing the darkblotched OY and increasing the widow OY. Specifically, the GMT estimates that a decrease in the darkblotched OY of 15 mt could be accommodated with a widow rockfish OY of approximately 515 to 540 mt. This 15 mt reduction could come out of the darkblotched bycatch limit in the whiting fishery to avoid a disproportionate impact to the non-whiting trawl sector. The expected year of rebuilding under the resulting darkblotched OY of 285 mt would become 2028, 2 years sooner than the preliminary preferred alternative.

Cowcod

The GMT reviewed the record of decisions related to the proposed OY alternatives for cowcod and the Council-preferred OY alternative of 3 mt adopted in April. As with any overfished species, the Council must rebuild in as short a time as possible while taking into account the needs of the fishing community. To that end, the GMT notes the Council should consider the following issues in setting a final 2009-2010 cowcod OY.

Changes to the 2007 Assessment and Rebuilding Analysis

The 2007 cowcod assessment incorporated a suite of corrections and changes to the previous assessment, resulting in revised estimates of several management reference points. The change in perception of stock status is reflected in the results of the revised rebuilding analysis. Due to technical flaws in the 2005 assessment, the GMT does not recommend direct comparison of revised rebuilding parameters to status quo values. The revised rebuilding analysis identifies a minimum rebuilding year ($T_{F=0}$) of 2061. A 2 mt OY extends the median rebuilding year by four years (to 2065) relative to the minimum rebuilding time. The preferred alternative OY of 3 mt extends the rebuilding time by another four years to 2069. A 4mt OY results adds another 3 years to the median rebuilding time (2072) relative to the preferred alternative (Table 1).

[2] 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. The shortest possible time to rebuild the stocks with revised rebuilding plans is $T_{F=0}$, which is the median time to rebuild the stock if all fishing-related mortality were eliminated beginning in 2009.

Table 1. Comparison of median rebuilding times, SPR harvest rates, and associated OYs (rounded to the nearest mt) for proposed alternative actions

OY	Median Rebuilding Year	SPR Harvest Rate
0	2061	$F_{100\%}$
2	2065	$F_{90\%}$
3	**2069**	$\mathbf{F_{83.6\%}}$
4	2072	$F_{72\%}$

Analysis of Impacts to the Trawl Fishery

Cowcod is one of the principal constraints to trawl fishing activity south of 40° 10′ N. latitude. Under the existing OY, trawl vessels in the south operate with RCA restrictions and trip limits for target species that are constrained in order to minimize impacts. A cowcod OY of 0 mt would close the majority of the trawl fishery south of 40° 10'. A 2 mt OY would not result in a complete closure of the trawl fishery, but would require relatively heavy restrictions that may include expansion of the trawl Rockfish Conservation Area (RCA) boundaries, or reductions to cumulative limits, or both. Analysis indicates that a 2 mt cowcod OY could reduce revenues in the trawl fishery by approximately 45 percent compared to a status quo OY of 4 mt.

Analysis indicates a 3 mt OY could accommodate a trawl fishery that is similar to status quo. However, a 3 mt OY could result in greater repercussions to fishing activity than a 4 mt OY, simply because there is variation in cowcod catch from year to year. For example, the status quo estimate of cowcod bycatch in the trawl fishery is approximately 1.3 mt, but estimates have ranged up to approximately 2.1 mt in past years under similar management regulations. It is more likely that such variation could be accommodated with a 4 mt OY than a 3 mt OY meaning that if bycatch is higher than expected, action may not be required under a 4 mt OY, but action could be required under a 3 mt OY. The rebuilding analysis suggests that the additional ton of catch relative to the preferred 3 mt OY adds three years to the median rebuilding time.

Analysis of Impacts to the Recreational Fishery

More than 99 percent of the catch of cowcod in the California recreational fishery occurs south of Point Conception. The fishery has remained below the current 0.3 mt harvest guideline (HG) under the 4 mt OY in 2005-2007. Under the 2 mt OY alternative the California recreational HG would be reduced to 0.15 mt. Although cowcod catch is projected to be 0.1 mt in 2007 under status-quo management, the average catch from 2005-2007 is 0.2 mt, which would exceed the HG under this option. Thus, under the 2 mt OY, actions such as depth restrictions would be need to reduce cowcod catch below the HG. A 40 or 50 fm depth restriction would reduce access to valuable fishing opportunities on the offshore banks and redirects effort to nearshore species. Alternatively, with a 3 mt OY, the resulting 0.23 mt HG for the California recreational fishery would accommodate the 3 year average catch without the need for a reduction of the depth restriction from 60 fm and allows for a shift in effort away from nearshore species assuming catches are not higher than the three-year average.

Species Currently Managed in Stock Complexes

In April, "as a general matter" the Scientific and Statistical Committee (SSC) recommended, "that the Council manage fisheries based on stock targets and thresholds that are defined at a level concordant with stock assessments, not based on an assemblage aggregate." (Agenda Item H.1.c, Supplemental SSC Report, April 2008). That general recommendation was followed with:

> However, if the Council elects to continue managing blue rockfish as part of the southern nearshore assemblage, in-season landings should be closely tracked to ensure that the blue rockfish catch does not exceed its ABC. This issue primarily applies to blue rockfish but other species may have similar concerns, e.g. longnose skate.

The GMT did not have opportunity to address this recommendation at the April meeting but did revisit the blue rockfish and longnose skate decisions at this meeting.

The GMT's discussion first focused on identifying criteria or factors that help delineate the pros and cons of managing a stock with "stock targets and thresholds that are defined at a level concordant with stock assessments" or "based on an assemblage aggregate." These pros and cons can be measured with respect to the resource (i.e., biological considerations), to management (i.e., administrative implications), and to industry. In general, the biological considerations involved the stock resilience and stock status. Management concerns focused on how well catch can be projected and tracked, how close recent catches have been to the ABC, and additional administrative duties related to tracking stocks individually. Discussion on industry considerations revolved around the additional burdens related to handling and sorting new species (e.g., safety, additional cost, practicality).

Longnose skates
As with most elasmobranchs, skates exhibit life history characteristics that make them vulnerable to overharvesting. These include long lifespans, low fecundity, slow growth, and late maturation. Uncertainty in historical catches used for the assessment, increasing landings of many skate species, and recent catch estimates approaching the ABC adopted by the Council in April contribute to the risk of exceeding the ABC for this stock in the future. While the latest assessment for longnose skates indicates that the stock is healthy (66 percent of B_0), the GMT recommends removing this species from the Other Fish complex and setting a species-specific OY. Given the uncertainty in the contribution of longnose skates to the Other Fish complex, the GMT recommends reducing the Other Fish ABC by 3,400 mt (based on ABCs of 3,428 and 3,269 mt in 2009 and 2010 respectively) in both 2009 and 2010 and then reducing that amount by 50 percent to derive OYs for the complex each year.

Likewise the GMT suggests that the other two skate species currently included in the groundfish Fishery Management Plan (FMP) (California and big skates) be listed under the scientific sorting requirement to facilitate gathering biological information for more refined management in the future. The GMT notes that these requirements place a burden on both industry and management. Either a species-specific OY for longnose or a scientific sorting requirement for other species would require landing skate species in the round until identification methods for dressed animals could be developed. Skates are large animals and handling them whole from the time of capture until sorting and/or sampling imposes logistical difficulties compared to landing mixed wings. For management agencies there is the increased regulatory burden of tracking longnose skate against an OY and collecting biological data on those species with a scientific sorting requirement.

The GMT notes that individual states may also consider exploring landing or sorting requirements for those species not included in the FMP (e.g. starry, sandpaper, roughtail, Aleutian, deep sea, etc.) but caught in appreciable amounts in commercial fisheries. The information gathered on these species could potentially inform inclusion in the FMP in the future, or other refined management to prevent overharvest of potentially vulnerable elasmobranch species. Alternatively, skates could be identified to individual species in the future under a rationalized trawl fishery with 100 percent observer coverage.

Blue rockfish

Blue rockfish are currently managed in the Minor Nearshore Rockfish complex for the areas both north and south of 40° 10′ N. latitude. The recent assessment for that portion of the stock in California waters North of Point Conception shows a depletion level of 29.7 percent of B_0 and recent catches approaching or exceeding the ABC adopted by the Council in April. Blue rockfish are characterized by high recruitment variability and uncertainty in key life history parameters (growth, fecundity, longevity, and maturation age). The STAR panel report notes that blue rockfish have lower natural mortality relative to species with which it is usually caught, and that most of the catch consists of females. The report concludes that "…for a given level of fishing intensity, spawning output will be reduced to a greater degree for blue rockfish than for other nearshore species." (Agenda Item D.3.a, attachment 4, November 2007). The GMT is concerned that blue rockfish may be vulnerable to overharvest, especially since the base model suggests the stock is currently in the precautionary zone.

The GMT discussed an alternative proposal by California Department of Fish and Game (CDFG) for a tiered OY for blue rockfish of 230 mt for waters off the state of California while still managing the species within the minor nearshore rockfish complex. Under the proposal the complex would be managed to achieve, but not exceed the combined blue rockfish OY and the remaining minor nearshore rockfish contribution under the overall minor nearshore rockfish OY. In other words, if the blue rockfish OY were not achieved, the remaining minor nearshore rockfish contribution could be increased to take that difference; however the converse would not be true (i.e. in order to prevent overharvest of blue rockfish). The GMT notes that at this time there is no regulatory mechanism to allow carry over of OY from one stock or complex to another.

In the state of California, blue rockfish are caught primarily in the recreational nearshore fishery, with some catch occurring in the commercial hook-and-line fishery. They are currently managed within the Minor Nearshore Rockfish complex. Removing blue rockfish from the Minor Nearshore complex in California and giving them an OY would decrease flexibility in the management of economically important nearshore fisheries by mandating specific action upon attainment of the OY in any one year. Federal agencies would also have the increased regulatory burden of tracking catches against the OY. The species in the nearshore fisheries are still caught as a mixed complex and achieving either the blue rockfish or the reduced minor nearshore rockfish OY would likely require closing the entire nearshore fishery due to inability to selectively harvest individual species within the complex. In other words, reductions in bag or trip limits alone for an individual species would increase regulatory discards while still resulting in total catches that exceed the OY. However, the GMT notes that if a species has its own OY, it is not automatically required that it must have species-specific management measures or trip limits (e.g. darkblotched).

Even with the concern over a possible increase in the need for inseason management and potential economic impacts, the GMT recommends specifying a species-specific OY for blue rockfish in California (2009 action alternatives 3 or 4). The ABC recommended by the SSC and adopted by the Council for blue rockfish in California at the April meeting (241 mt in 2009 and 239 mt in 2010) results from the base case model in the assessment. The GMT notes, however, that the 230 mt OY in alternative 4 reflects an OY set equal to the 2010 ABC from the base model (221 mt) with 9 mt added for the area South of Point Conception and no 40-10 adjustment rather than the base case model ABC adjusted by the Council's default 40-10 adjustment policy (reflected in OY alternative 3).

The GMT further notes that if a species-specific OY is chosen for blue rockfish in California, the Council needs to adopt minor nearshore rockfish OYs both north and south reduced by the contribution of blue rockfish in California. These correspond to the Alternative 3 minor nearshore rockfish OYs for both areas.

MANAGEMENT MEASURES

To facilitate the Friday decision on management measures under F.9, the GMT requests that the Council provide direction on catch sharing arrangements, especially for yelloweye rockfish. The GMT has reviewed the catch shares by sector in Chapter 2 of the DEIS for both canary and yelloweye. The two scenarios contained in this section are based on the percentages of canary and yelloweye OY after deducting yield set-asides to account for projected tribal, research, non-groundfish, and possible EFP fisheries (Table 2-6 in F.4.a, Attachment 1). These percentages are calculated based on the estimated impacts provided in the initial 2005 and 2007 scorecards for recreational and directed commercial groundfish fisheries. These analyses indicate varying impacts on fishery sectors depending on the catch sharing formula. The impacts of these sharing arrangements, based on canary and yelloweye OYs of 105 mt, 17 mt, and 14 mt respectively, compared to current estimates of impacts (i.e. from the April 2008 scorecard) are shown in Table 2 below.

Table 2. Yield amounts of canary and yelloweye rockfish from the Council-preferred OYs for directed commercial and state recreational groundfish fisheries based on the initial 2005, 2007, and current 2008 bycatch scorecards used by the GMT in their initial analyses of 2009-10 groundfish.

Groundfish Sector	Catch Shares by Sector							
	Canary 105 mt			Yelloweye 17 mt		Yelloweye 14 mt		
	2005 Sharing (mt)	2007 Sharing (mt)	SQ	2005 Sharing (mt)	2007 Sharing (mt)	2005 Sharing (mt)	2007 Sharing (mt)	SQ
LE Non-Whiting Trawl	20.7	21.8	9.1	0.3	0.1	0.2	0.1	0.6
LE Whiting Trawl	18.9	13.0	4.7	0.3	0.0	0.2	0.0	0.0
LE Fixed Gear	2.3	2.5	1.1	1.9	1.8	1.4	1.3	2.2
Directed OA	2.6	5.8	3.8	0.5	1.9	0.3	1.4	2.0
WA Rec	5.2	4.7	5.7	2.7	2.8	2.0	2.0	6.2
OR Rec	16.8	18.0		2.5	2.6	1.8	1.9	
CA Rec	24.1	24.9	9.0	2.8	1.7	2.1	1.2	2.1
Total	90.6	90.7	33.4	11.0	10.9	8.0	7.9	13.1

The GMT notes that there are issues with using bycatch scorecards to decide allocations. For instance, some estimates provided in the 2005 scorecard based on more recent understanding of the information for several commercial fisheries. For the whiting fishery, the GMT notes that in the 2005 scorecard there was a yelloweye value of 0.4 mt, or 2.8 percent of the directed fishery total. This value is inconsistent with bycatch estimates in all other years when there were few or no yelloweye rockfish captured by any whiting sector. For directed Open Access fisheries, the yelloweye and canary estimates in 2005 are well below the estimates for 2007. This is likely due to the fact that observer data from the Open Access fleet first became available in 2005 and was based on a relatively small sample size.

The GMT also noted an issue with the California recreational yelloweye estimate in the 2007 scorecard. The 2007 HG for the California recreational fishery was based on CDFG's RECFISH impact model that did not accurately reflect the proportion of catch by depth and proportion of catch by month for yelloweye rockfish. The yelloweye rockfish mortality impact projected by CDFG in their preferred alternative for 2007-2008 was 1.7 mt. This projection resulted in a California yelloweye rockfish recreational HG of 2.1 mt for 2007 and 2008. California subsequently revised its model resulting in a hind-casted catch of 3.0 mt for 2007.

With these considerations, the GMT requests guidance on the specific sharing scenarios to focus on for decision making under F.7 and F.9 to analyze based on the preferred OYs selected for OFS especially yelloweye and canary.

GMT Recommendations

- Adopt a final yelloweye ramp-down strategy.
- Consider reducing the darkblotched OY and increasing the widow OY with a commensurate change in the darkblotched bycatch limit in 2009-2010 whiting fisheries.
- Adopt a cowcod OY of 3 or 4 mt.
- Manage longnose skate with individual OYs rather than within the other fish complex.
- Manage blue rockfish in California with an individual OY rather than within the minor nearshore rockfish complexes.
- Provide guidance on the catch sharing scenarios for limiting species, particularly canary and yelloweye.

PFMC
6/9/08

Agenda Item F.4.d
Public Comments
June 2008

I attended a California Fish and Game informational meeting about the Yeloweye Rockfish which was very informative.
I would like to council to revisit the quota system for Washington, Oregon and California.
I was advised that California is alloted only 15% of the bycatch which does not seem fair for California.
We have more coastline than the other two states as well as more population so we should have a larger allotment.
Also I was advised that the other two states do not even meet their allotment.

Please fix this injustice to California!

Thank you,
Jay Bromley
564 Donner Lane
Ukiah, CA 95482

California needs a better split of the yelloweye rockfish between California, Oregon and Washington. California has has the most abundat population of yellow eye per recent stock assessment of the species, yet we get a small percentage. Please negoiate a fair percentages for California.

We are very concern with the current in-equitable allocation of recreational Yelloweye between the states, and ask that the basis for the allocation be re-examined in light of historical catches, data, and stock status.

Thank you
Bill Shelton
Newark California

To whom it may concern,

California needs a better split of the yelloweye rockfish between California, Oregon and Washington.
California gets a small percentage of the allocation but has the most abundant population of yellow eye per recent stock assessment. Please negotiate a fair percentage for California.

I am very concerned with the current in-equitable allocation of recreational Yelloweye between the states, and ask that the basis for the allocation be re-examined in light of historical catches, data, and stock status.

Best regards,

Robert Filbrun

mailto:filbrunrl@sbcglobal.net

Don McIsaac
PFMC Executive Director

Mr. McIsaak,

I am concerned with the current in-equitable allocation of recreational Yelloweye between the states, and **ask that the basis for the allocation be re-examined in light of historical catches, data, and stock status**, particularly with regard to California State recreational fishing regulations.

Matthew S. Plut
Dublin, California

Mr. Don McIsaac, PFMC Exec Dir.,

I'm writing in regards to the huge disparity in yelloweye bycatch among the three west coast states. California seems to rank at the bottom and yet the fishing effort is higher. California should have the highest allocation. Please take action to correct this disparity and place California where it should be among the states.

Thank You,
James Volberding

Executive Director Don McIsaac-

In light of the fact that the yelloweye stock in CA waters has shown to be much larger and robust than originally thought, it is imperative that the allocation sharing between CA, OR, and WA be revisited and changed to a more equitable basis. CA recreational anglers are currently being unfairly impacted by a non-realistic allocation that is prematurely shutting down healthy fisheries and severely limiting angling opportunities. In light of this, I strongly suggest that the allocation basis be looked at again with respect to updated information and stock status.

Respectfully,
Tim Machado
Northcoast Sportfishing

Mr. Don Mcisaac

I am a concerned about the results from the recent meeting for the 2008 groundfish season where the main issue of concern was the protection of the yelloweye rockfish. I would like to ask for a better allocation of recreational yelloweye rockfish that is based upon historical catches, data and stock status. Thank you for the consideration.

Hin Tsang

Dear PFMC Executive Director Don McIsaac,

I am concerned with the current in-equitable allocation of recreational Yelloweye between the states.

California needs a better split of the yelloweye rockfish between California, Oregon and Washington. California has the most abundant population of yellow eye per recent stock assessment of the species, yet we get a small percentage. I ask that you negotiate a fair percentages for California.

Currently there is an in-equitable allocation of recreational Yelloweye between the states, and I ask that the basis for the allocation be re-examined in light of historical catches, data, and stock status.

Thanks for your time,
Mitch Harper
Martinez, CA

Dear PFMC Executive Director Don McIsaac,

I am concerned with the current in-equitable allocation of recreational Yellow eye between the states.

California needs a better split of the yellow eye rockfish between California, Oregon and Washington. California has the most abundant population of yellow eye per recent stock assessment of the species, yet we get a small percentage. I ask that you negotiate a fair percentages for California.

Currently there is an in-equitable allocation of recreational Yellow eye between the states, and I ask that the basis for the allocation be re-examined in light of historical catches, data, and stock status.

Best regards,

Robert Baer

President

Aqua Jet, LLC

10040 Tesla Road

Livermore, CA 94550

Phone: 800-538-2260

Fax: 925-456-7761

5-19-08

P.F.M C

Don Hanson, Chairman

R.E 2009-2010 Ground fish Management, State apportionment of Yelloweye Rockfish mortalities.

Dear Chairman Hansen;

In Washington, and Westport specifically we have made great progress in reducing our catch of both Yelloweye and Canary rockfish, mostly by direct action by the fisherman by going to extremes to avoid them. I believe you remember how we reduced our Canary catch significantly when I was still on the G.A.P by voluntary action only.

Getting to where we are now has been at no small cost to my business, both in greatly increased fuel costs from running to clean areas to fish, and loss of business from decreased Lingcod catch and lack of opportunity to fish Yellowtail Rockfish from the 30 fathom restriction. Getting to below 2 metric tons will cause more hardship as well in my business.

Any reapportionment of Yelloweye mortality to an other area will only lead to unnecessary restriction, in one place and depletion in another as these fish do not move in the ocean with the paper fish.

I think it is important that the Council start creating incentives for fisherman to be good stewards of their resource, and not penalize them for successfully reducing their bycatch by transferring fish from their area to another. We are already existing under catch limits that were set after we started avoiding these fish in our area, and do not deserve more hardship and financial loss for trying to avoid them.

Respectfully;

Ken Culver

Charter vessel Tequila Too

PO Box 1197 Westport WA 98595

Kculver@seanet.com

From: Blake Topping
F/V Osprey
P.O. Box 162
Port Orford, Or 97465
topping@carrollsweb.com

Attn: John DeVore,

Dear Sirs,

I hold one of approximately 70 Limited Entry Nearshore Fishing Permits in the state of Oregon. This fishery without salmon, accounts for nearly one-third of my yearly income. Any reduction in the already very minimal allowed nearshore quota will have a serious impact on my business.

In this type of fishing we bring in a relatively small catch (400-500lbs. of assorted species per trip) which we deliver alive for a high per pound price ($2-$7/lb). Of all the ground fish harvesting, I would hazard to guess this fishery has the least impact on all species and the highest economic return (including canary rockfish, which I believe observer data will verify.)

Please consider the effect your decisions will have on those people and economies that depend on this specialized type of fishing that takes place in relatively small areas.

Thank you,

Blake Topping
F/V Osprey - 615984
Port Orford, Or 97465

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27 April 2008

Pacific Fishery Management Council
Attn: John DeVore

Please consider the following options to reduce Yellow Eye and Canary catch:

1. Bring Oregon sport anglers to same standard as Oregon near shore fishermen. Many near shore fishermen (Black & Blue and those with full near shore permits) use techniques and gear exactly like sport fishermen, i.e., jigging with rod&reel. So, why are sport boats allowed to fish 40 fathoms while the near shore jig fishermen are currently restricted to 30 fathoms (soon to become 20 fathoms)? Do the sport fishermen have a secret method for not catching overfished species ? When reviewing table 1 (projected impacts) it is noted that the sport boats will catch 33.4% of the Canary, and 41.3% of the Yelloweye, total yield. Analytically, lowering sport trip limits will generate the maximum gain in regards to reducing the bycatch . It is noted that Table 1 combines figure for Oregon/Calif projected recreational bycatch of Canary and Yelloweye. Why were the figures not shown separately for each state? Please note that during past years many Oregon based sport boats out of Brookings, OR, were fishing Pt. St. George Ca. in water targets typically 30 fathoms or greater. How does this factor into projected catches ? How will the proposed marine reserve at Pt. St. George, and other California areas, factor into reducing bycatch rates?

2. Do not punish all west coast commercial fisherman for a negative issue created by a few boats. Deal with boat skippers who catch high levels of overfished species and those who are flagrantly insensitive to maintaining a sustainable fishery. If problems exist in one geographical area then place restrictions on that area and leave others who manage their efforts alone! Restrict areas where the problems occur.

3. If long lining is the major source of overcatch -- reduce long line practices. Anyone who fishes knows that long liners have a much higher rate of bycatch (that is opposed to jig fishing). Why does Table 1 show Oregon other line with "658 lbs canary" when long liners show only "50 lbs" -- B.S. ! Something looks wrong with the 658# figure and it negatively impacts how the figures are perceived. What is needed is more long line observations and less small jig boat observations... Why does table 1 not list separate projected figures for near shore expected catch of Canary & Yelloweye (i.e. N & S of the 40.10 line)?

4. Be fair and equal with all fisheries. It is understood that the draggers may be allowed a larger bycatch of Yelloweye and Canary because the population of these fish are increasing. If there is an expanding population within trawl territory, then the population is also increasing in the near shore areas. Hence, the near shore fishery should also get similar treatment. It is noted that the Table 1 projected impact figures indicate that the entire 123 boat near shore fleet is expected to catch only 6% of the Canary/Yelloweye bycatch. Cutting the nears sore trip limits will have very little impact on the overall bycatch, and high impact on near shore income (which is reaching critical mass). If reductions are mandated then reduce trip limits of rock fish other than Blacks&Blues. Blacks and Blues are most often caught mid-to-top water depths less than 10 fathoms.

5. Do not adjust the commercial Ling Cod fishery below 2007 quotas -- ***increasing number of blacks show evidence of predatory marks.*** **PREDATORY BALANCE NEEDS TO BE MAINTAINED. In 50 years of fishing the Pacific I have never seen more lings than exists today (Southern Oregon area). However if Ling cod fishing has to be reduced, place the sport fisherman to the same schedule with commercials, i.e., no fishing lings Jan-April and during December. Also reduce the daily limit of sport caught lings -- some sport boats are bagging 8 lings a day with multiple trips per week. In total a sport boats' monthly catch surpasses the ling quota allotted to commercial boats -- I do not understand this situation! Figures presented in para 1 above strongly suggest that reducing trip limits of sport ling will have a significant positive impact towards reducing bycatch.**

6. Various fishing restrictions have and are being mandated by numerous organizations (state/federal). The near-future and overall impact of recent/new restrictions upon our total fishery is unknown. For example: what influence will California closures have on overall catch of Canaries and Yelloweye.. Inducing further change without conducting a comprehensive study to forecast possible repercussion of newly imposed restrictions seems very inappropriate.

7. Please understand that the Oregon near shore fishery has very little to no representation in the political arena, legal process, the PFMC or the many organizations which impact nearshore quotas and fishing regulations. Many nearshore fishermen have very small one-man businesses. Poor finances coupled with the need to work for a living, precludes any representation in the aforementioned. It is hoped that the FMPC/GMT will recognize this shortcoming and give reasonable consideration when discussing options, particularly those which restrict nearshore quota's.

8. Final note: In 1996 when I first bought into the open access arena, the monthly quota was 33,000 lbs. Currently there is an allotment of 400 to 800 lbs of black snapper per month (depending on period). Ling cod went from no restriction to a present quota of 400 lb per month, and the Ling season lasts only 7 months at best! Basically my quota has been reduced about 99 percent. We are now past the critical line of total disaster. Someone needs to develop a relief program, similar to the payoff for the salmon closure, or the state/feds needs to develop a buyback program. Why waste more money on studies when you can reduce all of the Canary/Yelloweye catch instantly by buying out licenses .

Input From One Nearshore Fisherman

CITY OF FORKS

500 East Division Street • Forks, Washington 98331-8618

(360) 374-5412 • Fax: (360) 374-9430 • Web: www.forkswashington.org
TTY: (360) 374-2696

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May 5, 2008

Pacific Fishery Management Council
Don Hansen, Chairman
7700 NE Ambassador Place
Suite 101
Portland, OR 97220-1384

RE: 2009-2010 Groundfish Management
State apportionment of Yelloweye Rockfish mortalities

Dear Chairman Hansen,

The City of Forks, Washington strongly opposes any reapportionment of the state by state recreational mortality values for Yelloweye Rockfish as shown on the "scorecard" beginning in 2007. Specifically those values were 6.2 metric tons for Washington and Oregon combined and 1.7 metric tons for California.

Over the past two years we have been making every effort to comply with the Yelloweye OY's adopted in the "ramp-down" approach to a long-term rebuilding regime. Through both voluntary avoidance and strict regulation we have been able to keep within our limits. The limit for 2007-2010 for Washington's share of YE mortalities has been projected as 3.5 mt, 3.0mt, 2.8mt, and finally 2.0mt in 2010. Our target each year to date has been to find a set of regulations that would result in mortalities that don't exceed 2.0 metric tons. Due to the length of the rebuilding program for YE we realize that we may be at that level for many years to come.

The cost of staying within our guideline has been very high. Getting under 2mt on the Washington Coast promises to be accompanied by drastic social and economic loses to our communities. Our city on the north coast of Washington could potentially lose our ability to harvest our halibut season and possibly even part of our salmon harvest.

Transferring our re-apportioning YE mortality to another area can only exacerbate the situation we now find ourselves in particularly when you consider the non-pelagic nature of this species of Rockfish. A transfer on paper has no concomitant transfer in the real world. These fish are very sedentary and spend the vast majority of their lives in one geographic location. Even though they are managed coast wide (which makes no sense) we doubt that there is much if any mixing between various habitats up and down the coast. Transferring impacts would only lead to unnecessary restrictions in one area and localized depletion in another.

Our recreational fishery off the Washington Coast relies heavily on ground-fish fisheries. We have healthy Black Rockfish, Yellowtail Rockfish and Lingcod populations. A further "artificial" lowering of allowable Yelloweye mortalities could severely curtail other fisheries. Additionally, you would be penalizing those who have been successful at avoiding these fish. The PFMC-adopted "Groundfish Strategic Plan (October 2000)" states on page 2 under "Vision for the future of the Groundfish fishery", 3rd paragraph: "Whenever possible, management approaches will create incentives for fishers to operate in ways that are consistent with management goals and objectives". Transferring impacts creates a disincentive – not an incentive. We make every effort to avoid impacts on an over-fished stock only to be penalized for it!?

We ask the Council to reject this attempt to reapportion the impacts.

Sincerely yours,

Nedra Reed
Mayor
City of Forks

May 10, 2008

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PFMC

Pacific Fishery Mgt Council
Mr. John DeVore
Portland, OR

Comments to GroundFish Mgt Team: 1. Inseason Mgt.
2. Yelloweye Impact reduction

Impacts on Canary Rock and Yelloweye RockFish are still within council guidance even with recent increases. @ 44 Canary, 18.9 Yelloweye

The most recent stock assessment on Canary RockFish establishes a much higher "OY" than the present assessment. Best science

Any early disruptions of the nearshore Oregon Fishery would deal a serious economic hardship on an industry already down, and a community out.

Yelloweye Rock Fish can be avoided by area closures. but overall the near shore rock fishery is very clean.

The present Fm. closure is effectively protecting Yelloweye habitat. Any reduction in nearshore quotas would be a hardship. Expanding Ling Cod access in winter months would help economicly and be bycatch neutral for other species.

Access to at least eight other species is controlled by Yelloweye bycatch in 09-10 mgt. period. Mortality rates inside 25 FM have been reduced by "deflation" before release. Nearshore fish bring a high X vessel price with very little bycatch. >1%

Newly available stock assessments should be incorporated into your decision to enact inseason MGT. ~~A~~ step down approach as proposed by the Council to reach OY for Yelloweye would be less disruptive and allow new stock info to be considered. * Annual stock OY would be preferred over the present 2yr.

Thank You

John Wilson

I am a nearshore fisher and seafood buyer in Gold Beach, OR

34201 Cedar Valley Rd
Gold Beach, OR 97444

WESTPORT CHARTERBOAT ASSOCIATION
P. O. BOX 654 • WESTPORT, WASHINGTON 98595

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PFMC

May 16, 2008

Pacific Fishery Management Council
Don Hansen, Chairman
7700 NE Ambassador Place
Suite 101
Portland, OR 97220-1384

Re: 2009-2010 Groundfish Management
State apportionment of Yelloweye Rockfish mortalities

Dear Chairman Hansen,

The Westport Charterboat Association strongly opposes any reapportionment of the state by state recreational mortality values for Yelloweye Rockfish as shown on the "scorecard" beginning in 2007. Specifically those values were 6.2 metric tons for Washington and Oregon combined and 1.7 metric tons for California.

Over the past two years we have been making every effort to comply with the Yelloweye OY's adopted in the "ramp-down" approach to a long-term rebuilding regime. Through both voluntary avoidance and strict regulation we have been able to keep within our limits. The limit for 2007-2010 for Washington's share of YE mortalities has been projected as 3.5mt, 3.0mt, 2.8mt, and finally 2.0mt in 2010. Our target each year to date has been to find a set of regulations that would result in mortalities that don't exceed 2.0 metric tons. Due to the length of the rebuilding program for YE we realize that we may be at that level for many years to come.

The cost of staying within our guideline has been very high. Getting under 2mt on the Washington Coast promises to be accompanied by draconian social and economic loses to our ports. The ports to the north of us could potentially lose their ability to harvest their halibut allocation and possibly even part of their salmon.

Transferring or re-apportioning YE mortality to another area can only exacerbate the situation we now find ourselves in particularly when you consider the non-pelagic nature of this species of Rockfish. A transfer on paper has no concomitant transfer in the real world. These fish are very sedentary and spend the vast majority of their lives in one geographic location. Even though they are managed coast wide (which makes no sense) we doubt that there is much if any mixing between various habitats up and down the coast. Transferring impacts would only lead to unnecessary restrictions in one area and localized depletion in another.

Our recreational fishery off the Washington Coast relies heavily on ground-fish fisheries. We have healthy Black Rockfish, Yellowtail Rockfish, and Lingcod populations. A further "artificial" lowering of allowable YE mortalities could severely curtail other fisheries. Additionally, you would be penalizing those who have been successful at avoiding YE. The PFMC-adopted "Groundfish Strategic Plan (October, 2000) " states on page 2 under "Vision for the future of the Groundfish fishery", 3rd paragraph: "Whenever possible, management approaches <u>will</u> create <u>incentives</u> for fishers to operate in ways that are <u>consistent</u> with management goals and objectives". Transferring impacts creates a disincentive – not an incentive. Why make every effort to avoid impacts on an over-fished stock only to be penalized for it!?

We ask the Council to reject this attempt to reapportion the impacts.

Respectfully yours,

Steve Westrick, President

May 14, 2008

Pacific Fishery Management Council
Don Hansen, Chairman
7700 NE Ambassador Place
Suite 101
Portland, OR 97220-1384

Re: 2009-2010 Groundfish Management
State apportionment of Yelloweye Rockfish mortalities

Dear Chairman Hansen,

Coastal recreational fishermen in Washington State are strongly opposed to any interstate transfer of the present recreational mortality limits for Yelloweye Rockfish. In 2007, the Council set mortality caps at 1.7 metric tons for California and 6.2 metric tons for Washington and Oregon combined.

Rebuilding Yelloweye Rockfish populations will require sustained conservation efforts to reduce mortalities to very low levels for many years. Over the four years, 2007 to 2010, Washingtons's share of the YE mortalities "ramp down" from 3.5 mt to 2.0 mt. The State of Washington has developed conservative regulations to limit YE impacts below these mortality levels.

These management actions have and will continue to exact substantial economic and social costs. On the North Washington Coast, the ports of La Push and Neah Bay, are particularly at risk because of their proximity to an abundance of the bottom structure that is prime YE habitat. Even with area restrictions, bycatch of YE rockfish could preclude harvesting halibut allocations and perhaps even further restrict salmon seasons in these areas. Constraining impacts below 2.0 metric tons will require even more severe restrictions. As YE abundance increases, it will become even harder to stay within these mortality limits. Therefore, it is only prudent to try and maintain impacts below the caps.

Beyond the basic unfairness of penalizing Washington State for aggressively conserving this most constraining stock, transferring unused YE mortality quota to another state is not scientifically sound because it has no biological benefit. Yelloweye Rockfish are not migratory, but spend their entire life in a small area perhaps even on the same structure.

Given these biological, economic and management realities, on behalf of the unaffiliated but tax paying and license buying recreational fishermen in Washington State, I ask that the Council reject the proposition to transfer Yelloweye impacts between states.

Respectfully yours,

Dave Seiler
PFMC/GAP member, Washington Recreational

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May 12 - 2008

To Whom it may concern:

My name is Roy Hill. I fish with hook and line. Any fish that I release, I believe they stay alive. I believe restrictions will cause hard-ship on the economy. I have a small boat. I don't believe that I'm causing any impact on the fish.

Thank you,
Roy Hill

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MAY 14 2008

PFMC

To the Pacific Fishery Management Council:
AttN, John DeVore

My name is Rick Rogerson and I have two small boats with Ground fish Permits in Oregon.
I don't believe my fishery has much impact on the Canary or yellow eye bi Catch.
I fish with Hook in line with in 30 fathoms The few Canary I do Cath are realeased live.
The Projected 08 Canary impacts of 44mT match the 08 Canary optimum yield. Why are restrictions needed?
I believe restrictions will cause severe economic hardship on me and my Community.
I believe the Canary and yellow eye are rebuilding because of restrictions now in place and don't believe we need any more!

Thank You
Rick Rogerson
P.O. Box 1363
Port Orford, OR
97465

FISHERMAN'S ADVISORY COMMITTEE OF TILLAMOOK

PO BOX 556
GARIBALDI, OR 97112

PHONE: 503-322-0007
FAX: 503-322-0831

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MAY 14 2008
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May 10, 2008

Pacific Fishery Management Council
Don Hansen, Chairman
7700 NE Ambassador Place, Suite 101
Portland, OR972201384

RE: 2009-2010 Groundfish Management
State Apportionment of Yelloweye Rockfish mortalities

Dear Chairman Hansen,

The Fisherman's Advisory Committee of Tillamook is opposing any reapportionment of the recreational mortality values for Yelloweye Rockfish that would be different from the amounts used in 2007. The values shown on the "scorecard" at the beginning of 2007 were 6.2 metric tons for Oregon and Washington combined and 1.7 metric tons for California.

Oregon and Washington have been making every effort to stay within their mortality limits even as those limits decrease annually due to the "ramp down" approach adopted by the PFMC three years ago. Both Oregon and Washington do in season tracking of their Yelloweye by catch, yet California does not. If we go over our YE cap, which seems likely with the ramp down process, our season for all rock fishing will be closed immediately. This, coupled with the recent Salmon closures, will cause harsh social and economic losses to our ports and coastal communities.

It would seem that we are being punished for doing a good job of keeping track of our quota's and staying at or even under our caps. California does their calculations of YE by catch at the end of the season only, and then find that they have gone considerably over their caps. Their solution is to demand more by catch quota rather than trying better regulation and data collection during the season.

Also, the ODFW stated that California was given a lower proportion of by catch quota because the Yelloweye are less dense in California than in Oregon and Washington. We would like to know if the science used to decide the apportionment figures have changed or does

FISHERMAN'S ADVISORY COMMITTEE OF TILLAMOOK

PO BOX 556
GARIBALDI, OR 97112

PHONE: 503-322-0007
FAX: 503-322-0831

California just need more by catch quota because they continue to over fish YE season after season. In addition, both Oregon and Washington Have a 20% depletion rate of virgin biomass while California has only a 9% depletion. (Re: YE Rebuilding Plan PFMC 2006) If reapportionment were to take place based on the stock of individual states, then more OY should be moved north to Oregon and Washington.

It is unfortunate that the ramp down is constraining all of our other fisheries so heavily. California may very well have more YE than has been projected, but so do we all, and it is getting harder to stay away from them for commercial and recreational alike. California needs to get a better handle on in season tracking of their YE mortality values and should be given a more equal share of depletion of biomass equal to Oregon and Washington before they demand more Yelloweye by catch quota from us. FACT feels that reapportionment without this effort taking place and without the science to back it up is not justifiable.

Sincerely,
Linda Buell, Co-Chair
Fisherman's Advisory Committee of Tillamook

FISHING VESSEL OWNERS' ASSOCIATION
INCOPORATED

ROOM 232, WEST WALL BUILDING • 4005 20TH AVE. W.
SEATTLE, WASHINGTON 98199-1290
PHONE (206) 284-4720 • FAX (206) 283-3341

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May 7, 2008

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, OR 97220-1384

RE: **Agenda Items F-4 and F-10, Tentative and Final Acceptance of 2009, 2010 specifications and management measures.**

Dear Chairman Hansen:

The Council will take action on both tentative and final specifications and management measures for the 2009 and 2010 fishing seasons during its June meeting. The following reflect the concerns and support of several proposed Council actions by those members of the Fishing Vessel Owners' Association (FVOA) that participate in the Council's limited entry fixed-gear fishery. The FVOA is a trade association with 95 family-owned fishing vessels. Our members fish approximately 42 fixed gear L.E. permits in the Council's jurisdiction. The Council's proposed actions and our members concerns on those actions are as follows:

1. **State reapportionment of Yellow-eye rockfish mortalities**

Yellow-eye rockfish currently is the most constraining overfished species for the fixed-gear industry. The reallocation of Yellow-eye rockfish to the south for California is not the correct biological answer for addressing the overfished status of this resource. This reapportionment would impose very high economic costs on the limited entry fixed-gear and open-access fleet to the north.

Unfortunately, Yellow-eye have not shown any life history tendency to migrate up and down the coast filling in depleted areas of the Yellow-eye biomass. The life history suggests they are sedentary once they find a preferred habitat. The reality is, even if the resource is described as a coastwide resource or even divided at the Oregon-California boarder, the resource off the north coast of Washington, which is showing signs of rebuilding, cannot be expected to fill in the low population levels off of California. This resource needs to have very conservative management throughout the many different Council regulatory areas.

Reapportioning this resource to the south of the Oregon/California boarder will artificially put greater pressure on stocks off California, and while effort will be less to the north and the resource perhaps rebuilding faster, that rebuilding will not migrate and help California.

The Council's publication, <u>**Status of Pacific Coast Groundfish Fishing**</u>, March 2008, which reviews the status of Yellow-eye rockfish states, "the 2006 coastwide biomass is calculated to be at 17.7 percent of the unfished level (with depletion rates of 8.5 percent, 21.8 percent, and 20.8 percent for California, Oregon, and Washington respectively)" – page 37. To allow a larger harvest mortality off of California is not in the best interests of rebuilding this resource off California. There should actually be fewer fish harvested off California in order to enhance the current depletion levels off California. Transferring Yellow-eye rockfish to California at the expense of Oregon and Washington from a biological standpoint is the wrong action.

The fixed-gear economic impacts to the states of Oregon and Washington would be significant. The Council has suggested several actions to further restrict fixed gear activity north of the Oregon boarder, which would need to be looked at if a reapportionment took place. The most significant is to move the fixed gear RCA to 125 or 150 fathoms. This would greatly restrict the directed halibut fishery off of Oregon, close other directed hook and line fisheries off of Washington, and limit the ability to harvest sablefish.

The Halibut Commission reports (see attachment) show that prior to the establishment of the RCA, 10% of the halibut had been taken inside of 100 fathoms. The fleet had 82 percent of its fish caught inside of 150 fathoms. Clearly, any additional movement of the RCA line deeper will result in greater competition for fewer spots where halibut can be targeted. In the past, restrictions like this resulted in lost and tangled gear and additional mortality to the targeted and bycatch species.

A high percentage of the sablefish fishery off the Olympic Peninsula is caught between 100 and 125 fathoms and between 125 to 150 fathoms. The limited entry fixed-gear fleet coastwide has been imposed with a proposed working cap of 2.2 mt of Yellow-eye in the Council score card for the past three to four years, while the recorded catch in California has gone from 1.7 mt in 2005 to close to 8 mt in 2007. The movement of the fixed-gear RCA would impose a significant economic impact on the fixed gear sector for very little gain in Yellow-eye savings to move the northern RCA deeper. The savings maybe .3 to .5 tons. The IPHC survey has recorded only one Yellow-eye rockfish deeper than 100 fathoms in their surveys. (See attached IPHC letter.)

2. <u>**Consider changing the length variance in LE permit length endorsements. Defer to the trawl rationalization analysis.**</u>

3. <u>**Require fixed gear to use a log book. This would greatly help in the assessment work of sablefish**</u>.

The members of the FVOA support the above actions. The current five foot plus or minus rule of the overall length endorsement does not permit a vessel owner to acquire the best vessel for his overall activities. Most limited entry fixed-gear participants participate in several fisheries in order to make a living. The five foot length variance was an attempt to control effort with a vessel L.E. program. Those fisheries that have gone to IFQ rationalization should not be affected by the five foot variance rule because the length of a vessel does not define fishing pressure as it did in an open access fishery or Limited Entry program that had too much fishing capacity.

The members of the FVOA have supported a log book program for a long time. It is believed this program will assist the managers on issues regarding seasonal movements of the fleet, confirm harvest and bycatch rates, provide information of other groundfish species, and provide information on size distribution of the different fixed-gear targeted resources.

In summary, the members of the FVOA do not support a reapportionment of Yellow-eye rockfish south of the Oregon/California boarder because it is the wrong action biologically for the resource rebuilding of Yellow-eye and the economic impact would be excessive based on the small savings that might be gained by moving the fixed-gear RCA deeper. The FVOA support elimination of the current five foot variance rule for the fisheries that have an IFQ rationalized format. Our Association also supports a fixed-gear mandatory coastwide log book program.

Sincerely,

Robert D. Alverson
Manger

RDA:cmb

Enclosure

Windows Live™

FW: 2A halibut and yelloweye interactions

From: **robert alverson** (robertalverson@msn.com)
Sent: Mon 4/21/08 4:06 PM
To: Carol Batteen (cmbatteen@hotmail.com)
Attachments: 2A Rockfish 97-99-01v2 bml.xls (210.4 KB), 2A commcat 1996_2000 by depth.xls (22.6 KB) Security scan upon download

Carol, please Tprint t his off. Thanks bob a

Subject: FW: 2A halibut and yelloweye interactions
Date: Mon, 21 Apr 2008 15:24:22 -0700
From: Bruce@iphc.washington.edu
To: robertalverson@msn.com

Hi Bob

FYI, I attach a file on commercial catch by depth we sent to the Council folks back in 2002 when these measures were first contemplated. If we were to look at the data now, they would be skewed by the existing depth restrictions, so would make the catch look like it was entirely from 100+ fms, but we are putting together such file for the Council folks (subject to the usual data restrictions re number of vessels involved). This file shows the 'unrestricted' depth profile of the fishery, prior to the existing depth restrictions. Certainly, a fair component of the catch (30-50%) can be in the 100-150 fm range.

I also attach a file on survey catches over the same period; most of the yelloweye are caught shallow of 100 fm although the maxdepth for a set can be deeper than 100. Only one yelloweye was caught when mindepth was deeper than 100 fm, so it is likely that very few are caught deeper than 100 fm.

I will forward the file on more recent data when it is finished. I also got your other letter concerning NPFMC doings and will call you this week.

Bruce

Area 2A commercial catch by depth (does not include research)

Log Weight, Target: Halibut, Longline only (FH, SN, AU)

Sum of net_wgt	Year											
Depth Category	1996		1997		1998		1999		2000		Grand Total	
0 fathoms to 49 fathoms	2923	1.6%	7226	3.3%	4653	1.9%	5028	3.2%	1901	1.5%	21731	2.3%
50 fathoms to 99 fathoms	21978	11.9%	12119	5.6%	11874	4.8%	9985	6.4%	15805	12.2%	71761	7.7%
100 fathoms to 149 fathoms	98785	53.4%	47319	21.9%	75691	30.6%	44216	28.4%	63096	48.8%	329107	35.2%
150 fathoms to 199 fathoms	33709	18.2%	118668	55.0%	118295	47.7%	38315	24.6%	32198	24.9%	341185	36.5%
200 fathoms +	27557	14.9%	30428	14.1%	37228	15.0%	58420	37.5%	16222	12.6%	169855	18.2%
Grand Total	184952	100.0%	215760	100.0%	247741	100.0%	155964	100.0%	129222	100.0%	933639	100.0%
Number of distinct vessels	49		58		58		46		52			
% of ticket weight covered	62.6%		54.7%		53.8%		36.2%		26.8%			

Log weight, Target: All species, Longline only (FH, SN, AU)

Sum of net_wgt	Year											
Depth Category	1996		1997		1998		1999		2000		Grand Total	
0 fathoms to 49 fathoms	2923	1.6%	7226	3.3%	4653	1.9%	5028	3.2%	1901	1.5%	21731	2.3%
50 fathoms to 99 fathoms	21978	11.9%	12119	5.6%	11874	4.7%	9985	6.4%	15805	12.2%	71761	7.7%
100 fathoms to 149 fathoms	98785	53.4%	47319	21.9%	75691	30.2%	44216	28.4%	63096	48.8%	329107	35.1%
150 fathoms to 199 fathoms	33709	18.2%	118668	55.0%	118295	47.2%	38315	24.6%	32198	24.9%	341185	36.4%
200 fathoms +	27557	14.9%	30428	14.1%	40281	16.1%	58420	37.5%	16222	12.6%	172908	18.5%
Grand Total	184952	100.0%	215760	100.0%	250794	100.0%	155964	100.0%	129222	100.0%	936692	100.0%
Number of distinct vessels	49		58		60		46		52			
% of ticket weight covered	62.6%		54.7%		54.5%		36.2%		26.8%			

Log weight, Target: All species, All gear (FH, SN, AU, TR, Handline, Unknown commercial)

Sum of net_wgt	Year											
Depth Category	1996		1997		1998		1999		2000		Grand Total	
0 fathoms to 49 fathoms	2967	1.6%	7226	3.3%	4653	1.9%	5028	3.2%	2161	1.4%	22035	2.3%
50 fathoms to 99 fathoms	21978	11.8%	12119	5.6%	11874	4.7%	9985	6.4%	15805	10.0%	71761	7.4%
100 fathoms to 149 fathoms	99295	53.5%	47319	21.9%	75691	30.2%	45425	28.9%	67155	42.5%	334885	34.6%
150 fathoms to 199 fathoms	33709	18.2%	118668	55.0%	118295	47.2%	38315	24.4%	39527	25.0%	348514	36.0%
200 fathoms +	27557	14.9%	30428	14.1%	40281	16.1%	58420	37.2%	33258	21.1%	189944	19.6%
Grand Total	185506	100.0%	215760	100.0%	250794	100.0%	157173	100.0%	157906	100.0%	967139	100.0%
Number of distinct vessels	51		58		60		47		60			
% of ticket weight covered	62.8%		54.7%		54.5%		36.4%		32.7%			

Sum of ticket weights for comparison

	1996	1997	1998	1999	2000
Net weight	295554	394771	460064	431235	482576
Number of distinct vessels	223	328	283	251	284

Table 1. 2008 Projected mortality impacts (mt) of overfished groundfish species after inseason actions taken at the April 2008 Council meeting.

4/9/2008

Fishery	Bocaccio b/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	11.7	9.1	1.2	258.6	81.5	7.1	0.6
Limited Entry Trawl- Whiting							
At-sea whiting motherships a/		4.7		40.0	1.9	275.0	0.0
At-sea whiting cat-proc a/							0.0
Shoreside whiting a/					0.0		0.0
Tribal whiting		0.7		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		1.1					2.2
Sablefish	13.4		0.0	0.6	0.3	0.9	
Non-Sablefish			0.1	0.4		0.5	
Open Access: Directed Groundfish							
Sablefish DTL	0.0	0.2		0.2	0.1	0.0	0.3
Nearshore (North of 40°10' N. lat.)	0.0	2.6	0.1	0.0	0.0	0.5	1.6
Nearshore (South of 40°10' N. lat.)	0.1			0.0	0.0		
Other	10.6	1.0		0.0	0.0	0.0	0.1
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.0		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
CPS- wetfish c/	0.3						
CPS- squid d/							
Dungeness crab c/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut c/	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	0.8	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 e/							
WA		5.7					6.2
OR						1.4	
CA	66.3	9.0	0.3			8.0	2.1
EFPs	11.0	0.1	0.2	1.0		3.4	0.1
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs. f/							
	2.0	5.5	0.2	2.0	2.0	1.1	3.0
TOTAL	116.4	44.0	2.1	302.9	90.1	344.4	18.9
2008 OY	218	44.0	4.0	330	150	368	20
Difference	101.6	0.0	1.9	27.1	59.9	23.6	1.1
Percent of OY	53.4%	99.9%	52.5%	91.8%	60.1%	93.6%	94.3%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data					

a/ Non-tribal whiting numbers reflect bycatch limits for the non-tribal whiting sectors.

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).

e/ Values in scorecard represent projected impacts for WA and OR. However, harvest guidelines for 2008 are as follows: canary in WA and OR combined = 8.2 mt; yelloweye in WA and OR combined = 6.8 mt. For California, harvest guidelines are represented.

f/ Research projections updated November 2007.

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Dear Pacific Fisheries Managment Council,

I am writing you a letter of concern for the near-shore live fish fishery. I have seen from the data ~~theyve~~ you've given us that the Canary rock fish population is doing well. I have also seen that the canary rock fish and yellow eye populations are doing well from the number I catch. ~~There~~ It is hard to record this information in our log books when we feel that they will be used against us to shut down our fishery. As near-shore live fisherman, we are live fisherman so when we catch a canary rock fish we immediately vent the fish and release it, which is a practice that most charter and sport boats should be using too.

This has been a very tough season ~~for all co~~ a lot of commercial fisheman on the West Coast. The Port Orford fleet needs its near-shore fishery with out anymore restrictions. Your studies say that stocks are on the rebound and are steadily coming up. Why restrict us or shut us down? There would be a major economic impact in this little town. I think you need to do a lot more studies and stock assessments before you even think about moving the RCA into shallower water or restricting long liners or, even worse, shutting down the fishery.

I hope you keep your near-shore commercial fisherman in mind as this is a fishery we all make a living on.

Sincerely,

Nick Bordelon

Nick Bordelon
Skipper, F/V Keta

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TO JOHN DEVORE:

I understand the Groundfish management team is considering adjusting quotas for nearshore fishing based on impacts to Yelloweye and Canary. All assessments currently show Canary rebuilding way ahead of schedule. If this trend continues why place further hardships on fishermen?.
Nearshore live fish rarely catch Canary or Yelloweye. These fish are not found commonly in the 15 fathoms or less that we do "live catch fishing". Why further restrict a fishery that is not in the primary habitat for canary and Yelloweye?

To close ~~fishery~~ fisheries based on a guess and a plan based on assumptions of stocks that we have no facts on is absurd. Couple this with the fact that by all projections Canary rockfish are rebuilding far ahead of schedule I see no valid reason to ruin fishermans livelyhoods.

Gene Fowler
S/V SEAHUNT

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May 11, 2008

Pacific Fishery Management Council
Attn: John DeVore

Cutting fisheries in 2008 will be detrimental to all fisheries. Studies show that yellow eye rebuilding is years ahead of schedule. This shows that fishermen are consciously working to help rebuild stock. As a commercial fisherman, I work hard to help sustain the fishery. I try to avoid areas that are natural habitats for yellow eye and canary. If I happen to catch any of these fish, I vent them and return them, live, to the sea. I have been encountering more canarys, in a wider range of depths, than ever before. This shows that they are also rebuilding.

I feel that a cut in 2008 is not necessary. The fishermen of today take care of their fisheries in order to sustain their livelihood. Please reconsider your decision to make these cuts. It is becoming harder and harder to make a living as a fisherman. Oregon's fishing communities are already hurting. Don't create an even bigger burden on them.

Sincerely,
Claude J. Sander
F/V Sea Hunt
P.O Box 697
Port Orford, OR
97465

5/13/08

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MAY 1 6 2008

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Pacific Fishery Management Council
Donald Anthon, Chairman
7700 NE Ambassador Pl, suite 101
Portland, Or 97220-1384

Gentlemen:

I would urge this Council to take another look at the allocation formula for Yellow Eye Rock Fish and Canary Cod Rockfish for California"s allowable catch for recreational fishing.

15% does not give California an equitable share of the allocation for California, Washington & Oregon. How was this figure determined?
It could not have been miles of coastline or 33% of the total.

I urge you to discuss this at your June 9-13 meeting in Foster City.

Sincerely,

Robert Ruddock
Joanne Ruddock

Robert Ruddock
Joanne Ruddock
3912 Scotts Valley Rd.
Lakeport, Ca 95453
(707)263-4585

CC: Congressman Mike Thompson
Senator Diane Feinstein
Governor Arnold Schwarzenegger

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Dear Sir

The Projected impacts For canary Rockfish are not Exceeding The Optimum yield so I Don't see any need of Reducing or making any restrictions For any fisheries. The canary Rockfish has already Rebuilded Itself so why stop Fishing because we are already Doing what you need done. The assesment says we are 41 YEARS AHEAD of schedule so why Penalize us when It will Be Very Hard on us Due To The Loss of Salmon This year when There ~~Is~~ ~~Know~~ need.

Sincerely
Darry L. Kuh

Port of Port Orford
Post Office Box 490
Port Orford, Oregon 97465

Telephone (541) 332-7121
FAX (541) 332-7121

e-mail: portoffice@harborside.com

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May 19, 2008

John DeVore
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Council Members;

This letter is to encourage the PFMC *not* to impose additional restrictions on nearshore commercial rockfish between the California border and Cape Blanco.

Fishing restrictions are being proposed because of the increased bycatch from 1.7 metric tons of canary rockfish to 2.6 metric tons. According to my calculations this translates to 396 fish. The balance between the economic impact to the 1,200 citizens of the community of Port Orford and rebuilding the canary rockfish stocks seems clear, primarily because these bycatch numbers are still within the optimal yield model, and the unexpected early progress towards rebuilding these stocks. Further restrictions to the fishing industry, at this time, based on such an insignificant number, seem unwarranted.

Thank you for your consideration.

Gary Anderson

Port Manager
Port of Port Orford

May 17, 2008

By E-mail & Fax

Don Hansen, Chairman
Pacific Fishery Management Council

Re: Public Comments

Mr. Chairman and members of the Council,

My name is Scott Hartzell, I currently use pots to catch my tier limits of Sablefish under the limited entry fishery. I would like to submit the following comments concerning the overall quota split between Trawl and Fixed Gear. To make it more in line with Alaska and Canada, the current 58-42 % split favoring trawl should be at the very least be reversed to 58-42% in favor of Fixed Gear. In 1990 when the current split was implemented the rationale was that Trawlers were getting large amounts of Sablefish by-catch so therefore they should get more quota. Rewarding bad fishing methods is not a very good reason to give more quota.

Currently Canada's split between fixed gear and trawl is 91.25% to fixed gear and 8.75% trawl.. Alaska is fairly close to this about 85%-15% in favor of fixed gear. Surely the current Council can see that the disparity that currently exists in our Permitted Limited Entry Fishery needs some very serious Tweaking.

Some of the reasons the Council should adjust this inequity that exists in our current quota split are. Fixed gear is much more environmentally friendly---There is far less by catch with fixed gear, especially pots---The value of fixed gear sablefish per pound is close to double what trawl caught are worth. If anyone is interested I can show them our last years average price per pound and the trawl price average.

The current trawl 2 month quota of Sablefish is more than a low tier for the whole year and the current split gives trawlers twice as much as a top tier. These inequities need to be adjusted, perhaps a little closer to our two neighbors to the North.

As a side note the Council needs to make escape rings of 4 inch diameter mandatory in all Sablefish pots (limited entry & open access) as it is in Canada. Another improvement in the fixed gear fishery would be to have all pot boats not leave their gear in the water when they return to port.

I hope you will give serious consideration to these matters.

Scott Hartzell (F/V Ossian)
Westlake, Or 97493

May 13 08

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Dear Mr. De Vore

If its true my voice means something to you, I'd like you to concider this: Don't hurt this Ports sustainable hook and line fishery any more than no salmon season, sanding in of our port, price of fuel and everything, lack of crab and bad weather all ready has!

From what graphs I've seen Cannary rock fish are the ~~closest~~ close to even a concern and "that's a wash": 44 mt projected catch verses 44 mt optimum catch. These fish are one the increse anyway, projected future quotas are up too: 105 mt for 09-10.

We are live fish fisherman. We get paid to keep fish alive. Do you think we can relese fish alive? Let us keep fishing and No More Draggers. 32 foot Boat size ~~limit~~ hook and line only = more fish and more jobs and better quality. ~~long live~~

Sincerely
James B Jennings

May 21, 2008

BY FAX, EMAIL, and U.S. MAIL

Mr. Donald Hansen and Members of the Pacific Fishery Management Council
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Re: Public Comments on 2009-2010 Groundfish Specifications and Management Measures

Dear Mr. Hansen and Members of the Pacific Fishery Management Council:

The organizations of the Marine Fish Conservation Network, Pacific Marine Conservation Council and Natural Resources Defense Council hereby jointly submit the following comments concerning the Preferred Alternatives selected for the 2009-2010 Groundfish Specifications and Management Measures.

Summary
We are seriously concerned about the Council's decision to not even analyze management measures or harvest specifications for the unassessed and vulnerable bronzespotted rockfish. We request that the Council choose more precautionary optimum yields ("OY") as the Preferred Alternative for the following species: Darkblotched, Canary, and Yelloweye Rockfish.

Introduction
The actions taken at the April Council meeting to reject analysis of management measures for bronzespotted rockfish and to increase yields for overfished and rebuilding species risk violating the Magnuson-Stevens Reauthorization Act ("MSA"). The MSA, as revised, requires that the Council "[specify] annual catch limits …at a level such that overfishing does not occur in the fishery." The MSA also requires that overfished species be rebuilt as quickly as possible, as was affirmed by the Federal Ninth Circuit Court of Appeals darkblotched decision, NRDC v. NMFS, 421 F.3d 872 (9th Cir. 2005), and prohibits overfishing during a rebuilding plan. The Council should employ a risk averse approach to setting OYs and ABCs (especially where reductions may be needed to

account for uncertainty and risk) to comply with the requirements of the newly reauthorized MSA, as noted by the Council's Scientific and Statistical Committee (SSC) in their April 2008 supplemental report (http://www.pcouncil.org/bb/2008/0408/H1c_SSC_SUP.pdf). A risk averse approach dictates setting lower catch levels that not only comply with the MSA, but speed the rebuilding process and benefit both fish and fishermen by generating robust populations that can sustain higher catches. If the Council and NMFS allow increased catch levels for overfished and rebuilding species when stock assessments show minor population increases or indicate more optimistic life history parameters, it will only serve to delay rebuilding. Maintaining or decreasing catch when stock assessments show progress towards rebuilding will speed the process and ultimately allow for more fishing sooner.

Bronzespotted Rockfish

Bronzespotted rockfish, managed in the minor shelf south stock complex, has never been assessed. A SW Fisheries Science Center report from February 2007 (attached) indicates that landings of this fish have declined dramatically. The life history characteristics of this species indicate that it is very vulnerable to fishing. The scientists' report recommends implementing "measures that would increase protection considerably with only modest impacts to fisheries. For example, imposing a limit of zero fish on recreational and/or commercial fishermen could ensure that targeting does not take place, and would encourage vessels to move when they encounter this species. It is unlikely that the measures necessary to provide greater protection for this stock would result in significant impacts on fisheries under the current management regime."

We strongly urge the Council to: (1) analyze and adopt a no retention requirement to protect this species immediately; and (2) move as quickly as possible to determine its population status.

(1) No retention policy

This no retention requirement has been recommended to the Council by scientists and the Groundfish Management Team (GMT) for over a year now, beginning in February 2007 with the SW Science Center Report, and including the supplemental GMT report of November 2007 (http://www.pcouncil.org/bb/2007/1107/D9c_GMT_sup.pdf), "The bronzespotted rockfish (*Sebastes Gilli*): A new poster child for West Coast groundfish?," a poster presented at the 15th Western Groundfish Conference (attached), and the supplemental GMT report of April 2008 (http://www.pcouncil.org/bb/2007/1107/D9c_GMT_sup.pdf).

The Council's assumption that the existing Cowcod Conservation Area ("CCA") provides adequate protection for the Bronzespotted rockfish is insufficient. First, the CCA does not protect against take outside the CCA. A no retention policy would address this deficiency. Second, the CCA was designed to protect Cowcod. Although there may be significant geographic overlap between the species, Bronzespotted may require additional boundary adjustments to provide sufficient protection. In addition, the CCA would need to be specifically designated for Bronzespotted protection to ensure that attempts to change the boundaries are not done without explicit consideration of this species.

(2) Assess the stock
We also request that the Council ask the NMFS SW Fisheries Science Center to assess the Bronzespotted rockfish in 2009 to determine if this species is overfished or experiencing overfishing. Given the alarming scientific findings thus far about the species, such an assessment is necessary to determine if a rebuilding plan is warranted.

Overfished and Rebuilding Rockfish
Many of the stock assessments for overfished groundfish species contain a high level of uncertainty. For these stocks with higher uncertainty, the Council needs to act with greater precaution by setting OYs that correspond with the lower bounds of stock population estimates to ensure that overfishing does not occur.

We are aware of and have sympathy for the impact to fishermen of lowered catch limits for overfished rockfish. We believe that the Council and NMFS should consider other measures to aid fishermen and fishing communities instead of choosing the higher level OYs which extend rebuilding times for overfished and rebuilding species in the face of downward population trends. The best hope for recovery of both the stocks and fishing opportunities is to minimize catch now to allow the stock to recover as quickly as possible so that higher catch levels can be realized sooner.

Maximizing catch levels during rebuilding plans can lead to situations where fishing opportunities later must be severely restricted or completely curtailed to meet statutory rebuilding requirements, especially when stock assessments show population decreases or a different understanding of life history parameters. Setting high catch levels during rebuilding will only prolong severely restrictive fishing limits and rebuilding periods.

Darkblotched Rockfish
The 2007 Darkblotched rockfish assessment contained significant changes, including the use of less optimistic productivity assumptions in the model. According to the SSC and GMT, "this change represents a fundamental change in our understanding of the stock's productivity and the shortest possible rebuilding time" (Supplemental GMT Report, Agenda Item H.1.c, April 2008 at 3) and was significant enough to "clearly require" "a revision in the rebuilding plan." Id. As part of this revision, the SSC recommended a redefinition of the target rebuilding time ($T_{target)}$.

Although the Council had this new understanding of the stock's lower productivity, it selected the highest OY (Alternative 4 with 300 mt) as its Preferred Alternative. This OY would increase the length of the rebuilding period by 19 years from its previous target date, and 12 years beyond the new $T_{F=0}$.

Significantly revising the rebuilding plan, including changing T_{target}, brings into question the issue of whether the stock can be rebuilt within 10 years. It is statutorily mandated under 16 U.S.C. § 1854(e)(4)(A) of the MSA[1] that if a species can be rebuilt within 10 years that it must be. See NRDC v. NMFS, 421 F.3d 872, 878 (9th Cir. 2005) ("As we noted above, § 1854(e)(4)(ii) is explicit that *if* a species can be rebuilt within 10 years, it must be.") (emphasis in original); see also Coastal Conservation Ass'n v. Gutierrez, 512 F. Supp.2d 896, 989 (S.D. Tex. 2007) ("If it is possible to rebuild an overfished species within ten years, the Service must do so."). This requirement contains no flexibility to go beyond 10 years to accommodate fishing interests. "The Agency may consider the short-term economic needs of fishing communities in establishing rebuilding periods, but may not use those needs to go beyond the 10-year cap set by subsection (ii)." NRDC, 421 F.3d at 880. According to the GMT, the new $T_{F=0}$ is 2018 and thus the species is capable of being rebuilt in the next ten years. Supplemental GMT Report 3, Agenda Item H.1.c, April 2008. Therefore, under 16 U.S.C. § 1854(e)(3)(A) of the MSA, it is statutorily mandated that the Council and NMFS rebuild the species within 10 years and Alternative 1 is the legally-required Preferred Alternative.

The news that the scientific understanding of Darkblotched's reproductive rate has changed and is now perceived to be lower than previously thought (SSC Report on Rebuilding Analysis, Agenda Item H.1.a, April 2008 at 3) should result in greater precaution and the choice of a correspondingly conservation-oriented Preferred Alternative–not the highest OY alternative. Although it is understandable that the Council wishes to keep the OY of a species high for the benefit of fishing communities, its legal obligation as a steward of the resource is to rebuild as quickly as possible. As the GMT summarized, the Ninth Circuit has instructed the Council and NMFS "that overfished species be rebuilt as quickly as possible," with "some leeway to avoid disastrous short-term consequences for fishing communities."[2] Supplemental GMT Report, Agenda Item H.1.c, April 2008 at 1 (quoting NRDC v. NMFS, 421 F.3d 872 (9th Cir. 2005)). "Some leeway" does not mean choosing the highest OY. It means choosing the lowest OY possible before a disaster to the fishing community is triggered. As the SSC acknowledges, the OY for 2007 was "specified at 190 mt." November 2007 SSC Report on Rebuilding Analysis, Agenda Item H.1.a, April 2008 at 3. Since no disaster resulted from this OY it was clearly viable for fishing communities. Accordingly, if the Council and NMFS do not act on their legal obligation to rebuild within 10 years under 16 U.S.C. § 1854(e)(3)(A), we urge them to at a minimum obey the Ninth Circuit law and

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[1] 16 U.S.C. § 1854(e)(4)(A) states as follows: Rebuilding plans or 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

[2] This leeway applies to rebuilding plans for species which cannot be rebuilt in 10 years. As discussed supra, however, Darkblotched can be rebuilt within 10 years and thus under the statute NMFS and the Council are statutorily obligated to do so without the discretion to extend the rebuilding period by choosing a higher OY.

choose Alternative 2 (159 mt) or Alternative 3 (229 mt), especially as Alternative 3 is above a level that has already been demonstrated to be non-disastrous.

Canary Rockfish
Given the high degree of uncertainty in the new Canary stock assessment (between 11.7% and 55.6%), we believe that the Council should choose a more precautionary alternative than Alternative 5 (105 mt). As the SSC notes, "uncertainty in the ABCs is not explicitly conveyed in the Council's current process." Supplemental SSC Report, Agenda Item H.1.c, April 2008 at 1. Moreover, this is a species that is vulnerable to being fished in excess of the OY. According to the SSC, during the period of 2000-2007 Canary was fished at 114% of the OY. SSC Report on Rebuilding Analysis for the 2009-10 Groundfish Fisheries, Agenda Item H.1.a, April 2008 at 1.

As discussed above under Darkblotched, the MSA requires NMFS and the Council to rebuild species as quickly as possible with some leeway available to avoid disastrous consequences to fishing communities. NRDC v. NMFS, 421 F.3d 872 (9th Cir. 2005). It was not a disaster to the fishing communities to operate under the 44 mt OY provided under the 2007-08 Specifications. Therefore, we believe that the Council should continue the 44 mt OY and allow the species to rebuild more quickly. In light of the more optimistic but highly uncertain stock assessment, choosing to increase Canary by some amount might be understandable (for instance, the 85 mt option which nearly doubles the previous OY amount), but selecting the 105 mt option appears to ignore the MSA obligation to rebuild quickly as well as the highly uncertain nature of the stock assessment. Therefore, we urge the Council to choose either the 44 mt or 85 mt option as its Preferred Alternative.

Yelloweye
We join the GMT in urging the Council to stick with the ramp-down plan as the Preferred Alternative. See Supplemental GMT Report, Agenda Item H.7.c, April 2008 at 1 ("[W]hile a less aggressive ramp-down strategy may provide some short term relief, preliminary analysis shows the end result will require lower harvest levels after the ramp down is complete."). Although we understand lower Yelloweye catch has socio-economic impacts, it is the Council's stewardship obligation to lower catch to a level that allows this vulnerable species to begin to rebuild. The ramp-down plan was itself a delay to rebuilding to accommodate economic interests. Further delay by failing to implement the next step is inconsistent with the rebuilding plan and a violation of its terms.

We support the investigation that the State Agencies and the GMT are making into developing management measures (e.g., depth, season and trip restrictions, area closures, etc.) which will soften the impact to communities of rebuilding Yelloweye. Supplemental GMT Report, Agenda Item H.7.c, April 2008

Conclusion
In summary, we are deeply concerned with the Council's and NMFS's lack of action when presented with repeated recommendations from scientists and the management

team to develop and adopt management measures to protect Bronzespotted rockfish. The management team and scientists have clearly stated that the no retention requirement for Bronzespotted is not projected to have a significant impact on fisheries. We hope the Council will remedy this situation by analyzing and implementing a no retention requirement for Bronzespotted and requesting an assessment of this species during the 2009 assessment cycle.

We are also disappointed by action at the April 2008 Council meeting that reversed more conservative preliminary preferred OY alternatives in favor of higher OYs for overfished Darkblotched and Cowcod rockfish, and rebuilding Canary rockfish, and created a new ramp down alternative for the Yelloweye rockfish. The Council should select final OYs for these species that decrease catch limits to facilitate faster rebuilding.

By adopting a more precautionary approach, the Pacific Fishery Management Council has an opportunity to cement its reputation as one of the leading Councils in upholding the MSA to prevent overfishing and protect rare species. We look forward to the opportunity to work with you in this endeavor.

Thank you.

Sincerely,

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cc: Frank Lockhart

Summary of Bronzespotted rockfish (*Sebastes gilli*) conservation concerns

SW Fisheries Science Center Report
February 2007

Bronzespotted rockfish (*Sebastes gilli*) are a large, relatively rare species that occur mainly in Southern California waters, in deep rocky habitats similar to those for cowcod (*S. levis*). During a review of methods for estimating California fish landings being conducted by the SWFSC and CDFG Marine Division, it was noted that commercial landings of bronzespotted rockfish, after rising to an estimated peak of 94 tons in 1982, dropped rapidly in the late 1980s and remained at very low levels (generally less than 1 ton per year) from 1990 to the present (Figure 1). When plotted relative to the Minor shelf south complex within which this species is managed, this suggests that the decline in landings of bronzespotted preceded the decline in both minor shelf and overall landings of rockfish over recent decades. Very limited information is available from recreational fisheries, however what little information does exist suggests that most of the recreational catch comes from rare trips that catch large numbers of bronzespotted rockfish (Figure 2). Anecdotal information suggests that there are distinctive fishing strategies that were used historically to target bronzespotted.

Port sampling data for southern California from 1984 through 1990 is among the most comprehensive in the historical period, suggesting that landings for the period of greatest observed decline were reliably estimated. Bronzespotted are easily identifiable and it is unlikely that they would be mistaken for a different species. Additionally, a metric currently underdevelopment by NMFS and CDFG staff for evaluating the reliability of species-specific landings estimates of rockfish suggests that bronzespotted are one of the 12 top species with respect to the reliability of landings estimates based on a range of criteria (ease of identification, number of market categories that it occurs in). In his comprehensive review of the life history characteristics for 10 species of commercially important or abundant California rockfish, Phillips (1964) cited both cowcod and bronzespotted as two of the species of commercial importance that should be the subject of future studies.

Despite this recommendation, very little is known about the life history of this species. The spatial distribution is described as ranging from Monterey Bay, CA to Punta Colnett (northern Baja California), with a depth distribution ranging from 75 to 413 meters. Preliminary results from a total of 38 aged fish, of sizes ranging from 35 to 70 cm, suggested slow growth and high longevity. Ages ranged from 17-89 years (Figure 3), considerably older than the oldest ages estimated for cowcod. This would indicate that both the natural mortality rate (M) and the Von-Bertalanffy growth coefficient (K) are considerably lower than those estimated for cowcod, suggesting a life history pattern associated with high vulnerability to fishing.

As a result of data limitations, it may be difficult to conduct a quantitative assessment for this stock. Although the protection already provided by Southern California's Cowcod Conservation Area and existing Rockfish Conservation Areas should be sufficient to protect the stock, there may be other measures that would increase protection considerably with only modest impacts to fisheries. For example, imposing a limit of zero fish on recreational and/or commercial fishermen could ensure that targeting does not take place, and would encourage vessels move when they encounter this species. It is unlikely that the measures necessary to provide greater protection to this stock would result in significant impacts on fisheries under the current management regime.

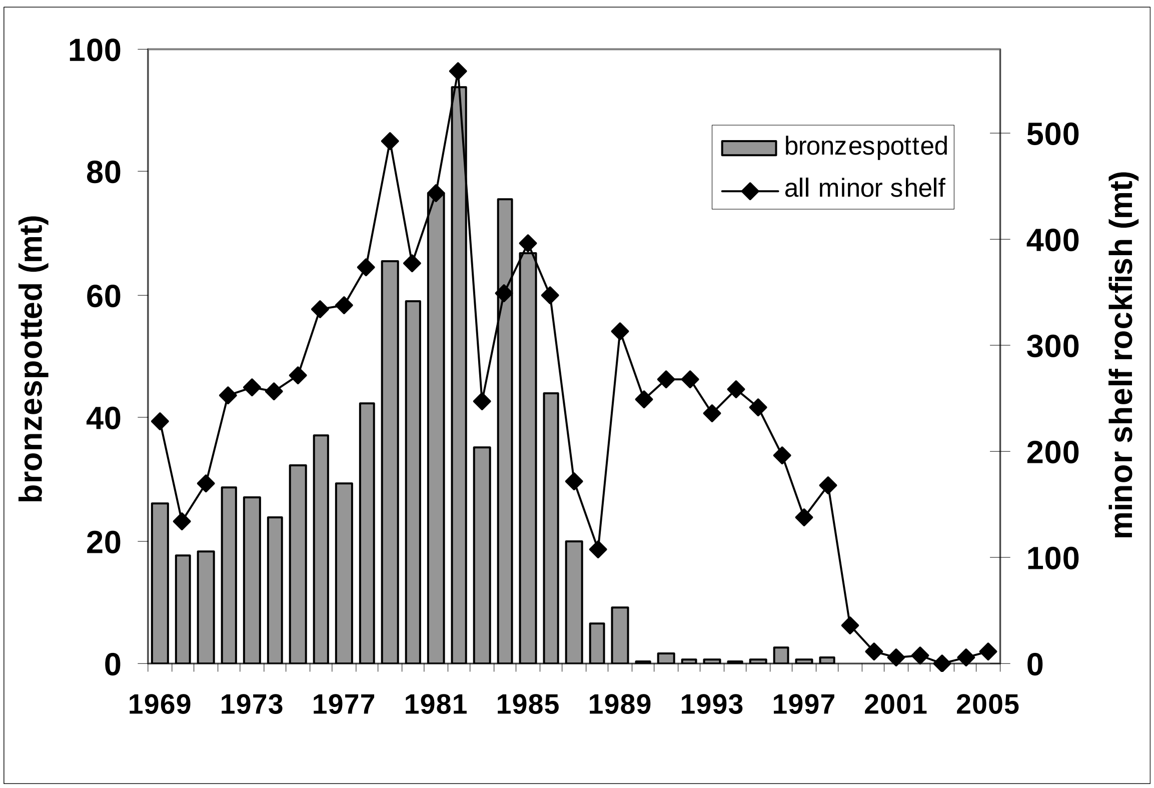

Figure 1. Estimates of commercial landings of bronzespotted rockfish relative to landings of all "Minor shelf" rockfish in the San Diego, Los Angeles and Santa Barbara port groups (CalCOM, January 2007).

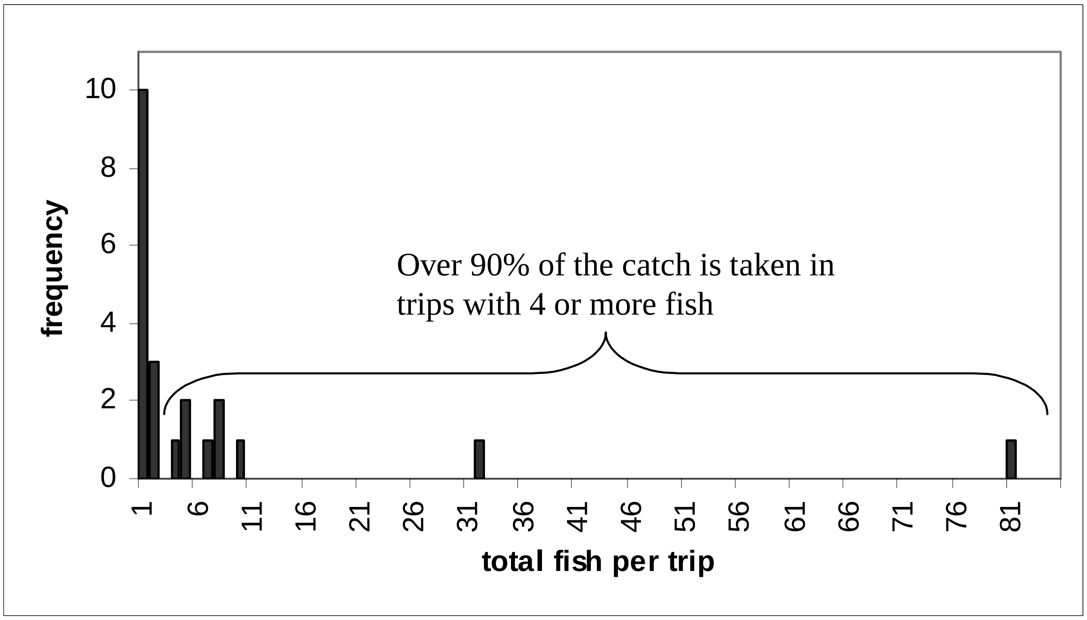

Figure 2: Catch frequency distribution (number of fish per trip) for CPFV trips, suggesting that when bronzespotted rockfish are encountered, they tend to be in clusters.

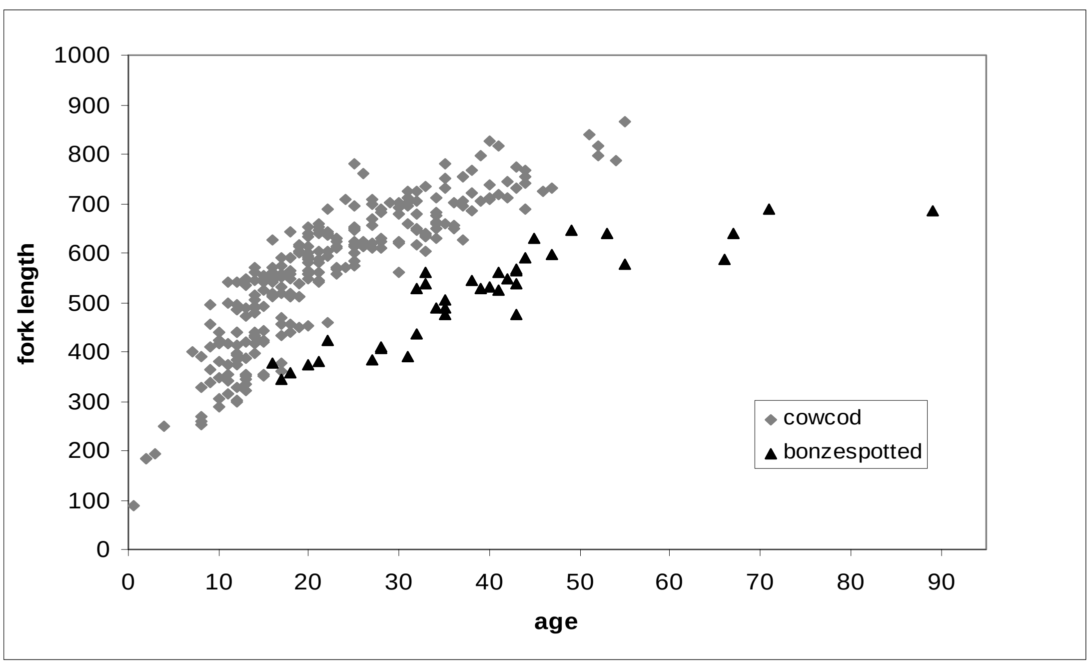

Figure 3: Preliminary age and growth data for bronzespotted rockfish, relative to age and length data used in the most recent (2006) cowcod assessment.

The bronzespotted rockfish (*Sebastes Gilli*)
A new poster child for West Coast groundfish?

Poster presented at the 15th Western Groundfish Conference
February 2008 in Santa Cruz, CA
John C. Field, Don E. Pearson and Alec D. MacCall
Fisheries Ecology Division, Southwest Fisheries Science Center, Santa Cruz, CA

Abstract

Bronzespotted rockfish (*Sebastes gilli*) are a large, relatively rare rockfish species that occur primarily in Southern California waters, in deep rocky habitats similar to those for cowcod (*S. levis*). Commercial landings of bronzespotted rockfish dropped rapidly in the late 1980s, and have remained at very low levels over the past 20 years. Limited information is available from recreational fisheries, however what little information does exist suggests that most of the recreational catch comes from rare trips that catch large numbers of bronzespotted rockfish. Age and length data suggest very slow growth and high longevity, a life history pattern commonly associated with high vulnerability to fishing.

Introduction

Bronzespotted rockfish (*Sebastes gilli*) are a large, relatively rare species that occur mainly in Southern California waters, generally in deep rocky habitats similar to those for cowcod (S. levis). The spatial distribution is described as ranging from Monterey Bay, CA to Punta Colnett (northern Baja California), although the species is rare north of Point Conception (Love et al. 2002). The depth distribution is described as 75 to 413 meters, with most animals observed deeper than 200 m., including the few juveniles that have been observed in ROVs. In his comprehensive review of the life history characteristics for ten species of commercially important or abundant California rockfish, Phillips (1964) cited both cowcod and bronzespotted as two of the species of commercial importance that should be the subject of future studies. Despite this, very little is known about the life history of this species.

Fisheries

Commercial landings of bronzespotted rockfish dropped rapidly in the late 1980s and remained at very low levels from 1990 to the present. When plotted relative to the minor shelf south complex within which this species is managed, this suggests that the decline in landings of bronzespotted preceded the decline in both minor shelf and overall landings of rockfish over recent decades as a result of increasingly restrictive management measures (Figure 1). While the hook and line fishery has traditionally accounted for most landings, the rapid growth of the Southern California gillnet fishery in the early 80s accounted for most of the mortality during the period of apparent decline (Figure 2), consistent with the movement of effort to deeper and rockier habitats in that fishery.

Although pre-1984 estimates of landings are based on ratio estimators from data collected in later years, the confidence in landings estimates for the 1984-1990 period is high, due to effective port sampling data, the ease of identification, the relatively small number of market categories in which bronzespotted occur, and other factors. While the catch history for bronzespotted since 1983 is fairly reliable, the determination of meaningful catch limits for this otherwise data-poor species will be difficult. Yet such limits will be even more difficult to derive for those species for which even the catch histories are unreliable; which includes as many as 27 rarely or infrequently encountered Sebastes species in California waters (Pearson et al., in prep).

The limited information for recreational fisheries suggests that bronzespotted are infrequently encountered, but that most of the recreational catch is from rare trips that catch moderate to large numbers of this species. Trips that do encounter bronzespotted typically encountered cowcod as well, often in relatively large numbers.

Growth

We located 119 otoliths with associated length information (from 25 to 71 cm) from a range of collections. These were aged by an experienced age-reader (D. Pearson) using break and burn methods. Results showed a range of ages from 17-89 years, and were used to fit a growth curve (Figure 3) based on Schnute (1981). The oldest age recorded for bronzespotted rockfish (89) exceeded the oldest ages recorded for cowcod (55), although a formal age validation has not been conducted for either of these species. The estimated Von-Bertalanffy growth coefficient (K) for bronzespotted is 0.033, which along with shortraker rockfish (S. borealis) and shortspine thornyhead (*Sebastolobus alutus*) are among the lowest growth rates reported. There was not sufficient information to estimate maturity schedules, however most fish greater than 35 cm were mature and a 32 cm female was immature.

Discussion

The dramatic reduction in landings prior to highly constraining management actions, and the age and growth information that suggest high vulnerability to overexploitation, are sufficient to warrant concern with the status of this stock. Yet given the paucity of available data, a quantitative stock assessment will be difficult to derive. The habitat associations of this species suggest that existing management measures should be sufficient to protect the stock in the near term, yet additional measures could increase protection with only modest impacts to fisheries. A ban on retention could encourage vessels to move when they encounter this species; a rational behavior given the association with cowcod. Explicitly linking management measures for these two species would also be a reasonable management approach, and would not result in significant constraints to existing fisheries.

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Schnute, J.T. 1981. A versatile growth model with statistically stable parameters. Canadian Journal of Fisheries and Aquatic Sciences. 38:1128-1140.

Acknowledgements

We thank John Hyde, Brenda Irwin, Milton Love, and H.J. Walker for the use of otoliths from their collections, John Butler, Bob Lea, Milton Love and Mary Yoklavich for their insights on fisheries and habitat associations, E.J. Dick for his help evaluating landings data, Diana Watters for her assistance with ages, and John Butler for the use of his photo.

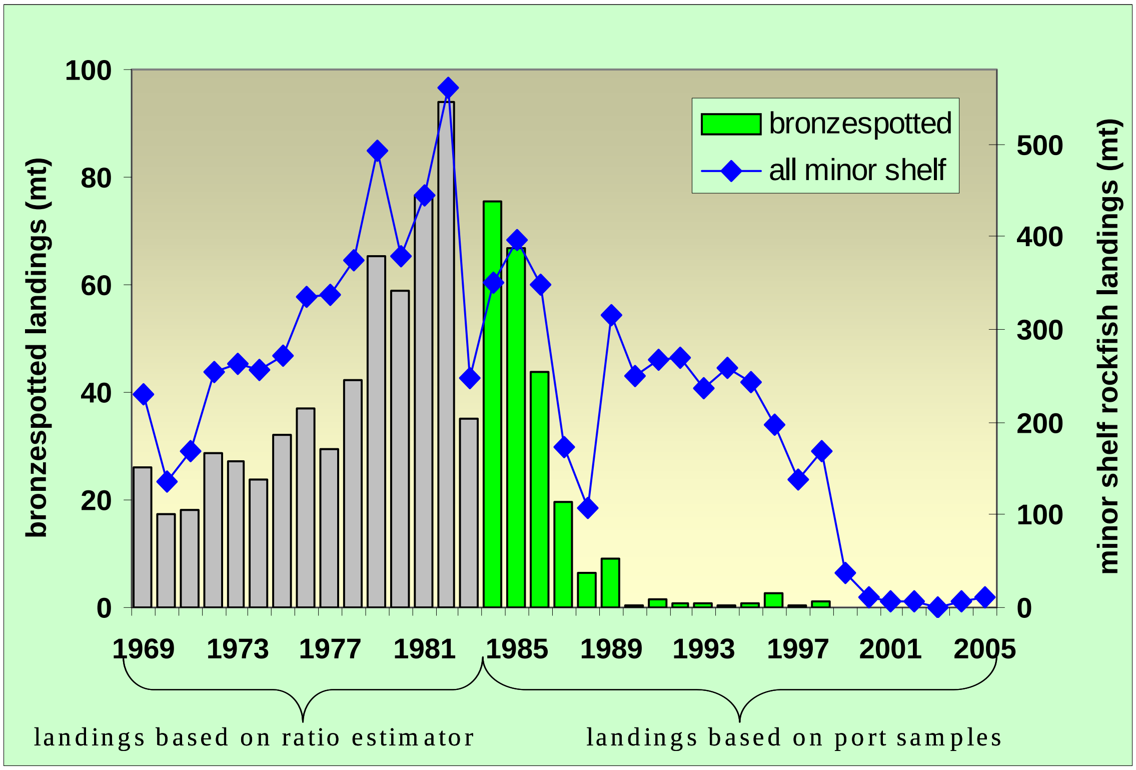

Figure 1. Estimates of commercial landings of bronzespotted rockfish relative to landings of all "minor shelf" rockfish in Southern California port groups (data from CalCOM, January 2007).

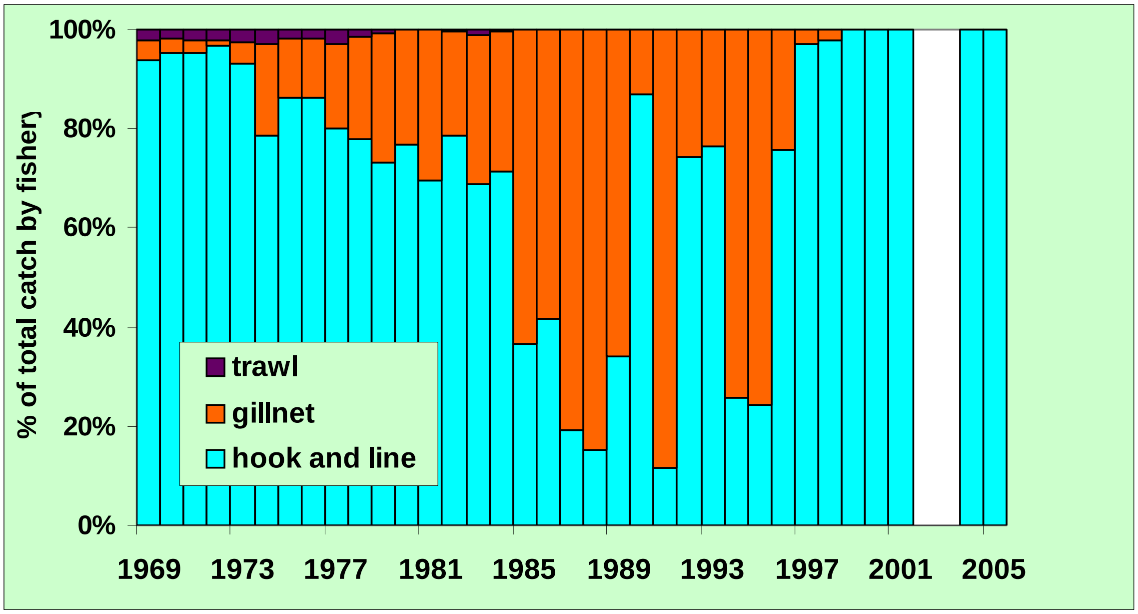

Figure 2. Fraction of bronzespotted catch by gear type over time.

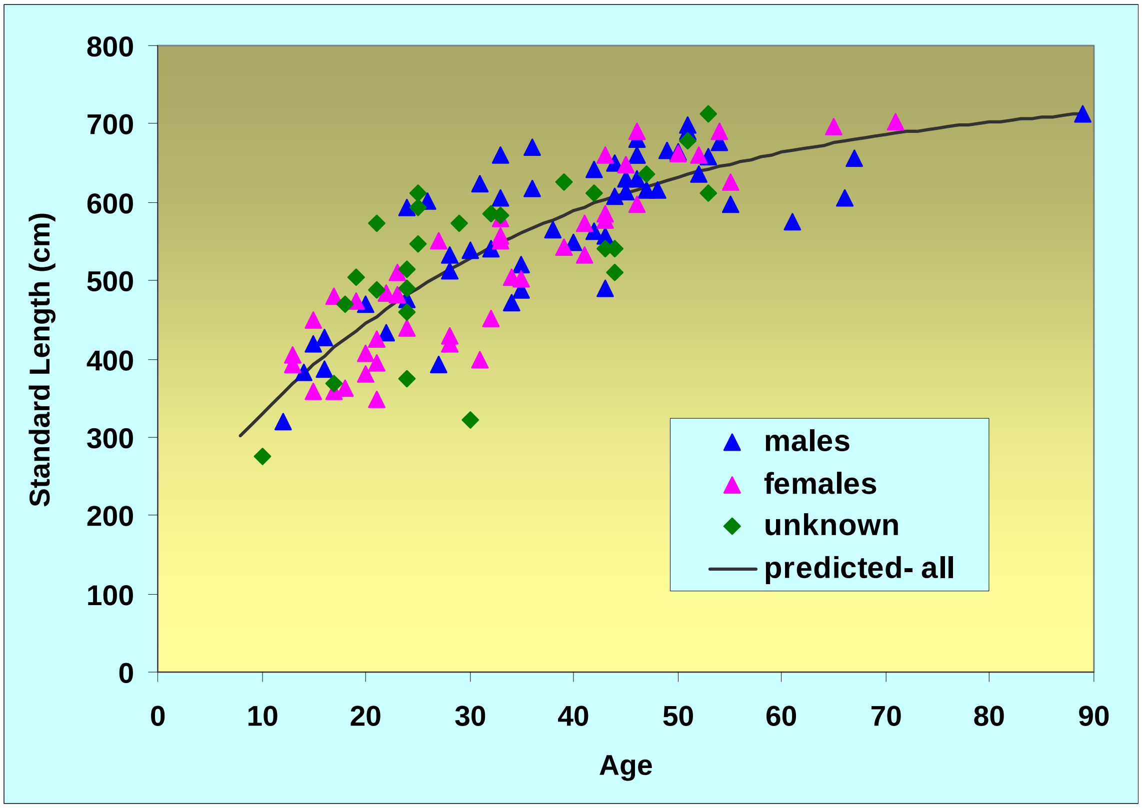

Figure 3. Estimated growth curve.

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MAY 1 6 2008

PFMC

To The PFMC

ATTN: John DeVore

① The cost of fishing has gone up due to gas price VMS, EPIBS, with the fish prices not going up accordingly

② Quotas going down will hurt our Econmy.

③ Live fisherman Try to vent all fish that need because They are our fishing Future

④ your impacts for 08 projected at 44 that matches your max yield same as c

⑤ I would like know why your projec are high when the Canary stocks ar way ahead of schedle on recovery

⑥ Most fisherman in our area do no fish out to 30 fm because it is almo Impossible to keep Those alive for the ~~pue~~ Live fish buyer which pays mo higher prices

⑦ This is a great fishery and is im thru our own conseuative efforts

3) Very few of us would be able to stay within the 20 fathom line without it being a straight line.

Sherman fish vessels
Darci Sherman

Agenda Item F.4.d
Supplemental Public Comments 2
June 2008

F/V Pacific Mistress

Captain Mark L. Roberts

P.O. Box 786, Pacific City, OR 97132

503-537-6465

To John.DeVore@NOAA.Gov
Pacific Fishery Management Council
Public Comment for June 2008 Council Meeting

On April 28th, 2008 the Oregon Department of Fish and Wildlife held a public meeting to discuss the setting of harvest levels and management measures for the next two years of recreational and commercial ground fish fishing. During that meeting I was made aware of several concerns that I would like to address in this letter.

Two Year Management Schedule

The first issue that was raised that concerns me is the PFMC's two year management schedule. With new information constantly coming to light I feel that it is detrimental to our fisheries to address harvest levels and management measures only once every two years.

When decisions are made for the 2009-2010 fishing years, no matter what new data comes to light we will be stuck with the harvest guidelines adopted in 2008 and there will be no means of addressing ever changing fish data again until 2011.
Since there will be full assessments on many species and updated assessments on several species of rockfish in 2009, and since the previous assessments are still driving an ever down-ward harvest based on the old data, I believe that waiting until 2011 to act on the new data is too long to wait. My small business depends on being able to catch fish. The sooner the data is incorporated into the models with the possibility of larger harvest levels, the better.

An example would be the "canary in the coal mine" issue of the Yelloweye Rockfish. Yelloweye is scheduled for a "Full Assessment" in 2009. If that assessment shows a miraculous rebuilding of the species ahead of schedule (ala Ling Cod), the PFMC would not be able to relax rules on this species until 2011, possibly leaving other, more plentiful species (such as Ling Cod) under fished with quota left on the table.

Interpretation of Data
The second concern I brought home from the meeting: How the data is being interpreted. If the assessment is interpreted and then reinterpreted later, it appears to the fishermen that there is the possibility that the data is being manipulated to achieve an end or to justify previous decisions. As explained to us in the meeting, stock assessments were done over the course of several years on one species, but at different times of the year. The data was crunched and then later reevaluated with the different times of year factored in and different conclusions were made about the health of this particular species. This gives the fishermen less than stellar confidence in the data that controls our ability to make a livelihood.

Management zones
The third concern is the North-South split “Management Zones” (40.10 degree line). When the data is looked at for Yelloweye Rockfish, it is obvious that the “hot spots” for catching Yelloweye are all centered around Northern California and Southern Oregon. Commercial Fishermen on the Central and Northern Oregon coast do not have the type of interaction with the Yelloweye that fishermen on the Southern Oregon and Northern Californian coast seem to be having. It was pretty much agreed upon in our meeting on April 28th in Tillamook that there should be more federal management zones to better model the impacts on Yelloweye that different parts of the state are inflicting. On the Central and Northern Oregon coast, the near shore rock fishermen are having very small to Zero impact while fishing for Black & Blue Rockfish and for Ling Cod. To limit *us* because of the excesses of our more southerly brethren seems to be grossly unjust.

Proposed Depth Restrictions and/or Further Catch Limitation
Depth restrictions and/or reductions in target species catch to protect Yelloweye Rockfish for all near shore rockfish fishermen seems to be overkill. Near shore Black and Blue Rockfish and Ling Cod fishermen on the North and Central Oregon Coast are having a near Zero impact on the Yelloweye population. Either or both of these proposed options to “protect” Yelloweye will become an extreme economic hardship on the near shore fishing fleet in the North/Central Oregon Coast areas.

The proposal for further depth restrictions was explained to us as a change from a 30 fathom maximum fishing depth to a 20 fathom maximum fishing depth, with the possibility that the 20 fathom number could be reduced to 15 fathoms. This kind of restriction would probably not affect the Southern Oregon Coast as much as it affects the North/Central Coast. In Southern Oregon the reefs are close to shore, with many fishermen fishing in water as shallow as 3 fathoms of water. In the North/Central part of the Coast, most of our reefs don’t even begin inside 15 fathoms and most are in deeper water … in the 25-45 fathom range. Our reefs from 30-45 fathoms have all ready been closed to us and these were historically some of our best producing reefs.

The economic impact for my operation of not being able to fish the waters between 20 & 30 fathoms of water is that I will be pushed off the most productive reefs on which I fish for Ling Cod (I hold a Black and Blue permit, but rarely target them). I would be forced to spend more days at sea, burning more fuel, losing more tackle and making less per pound. I sell Ling Cod to a live fish market and my live fish buyer will come to port for our present one month quota, but will not come to port of only small portions of that quota. I believe that, in dollar terms, the economic impact would be as much as $850 - $860/month or $5,950 - $6,020 a year. (I am basing these assumptions on having to sell the Ling Cod at a lower price if sold dead and loss of monthly quota that I will not be able to catch each month in the shallower water. At the present time I am earning $3.25/lb for live Ling Cod. Please note, I have NOT factored in the additional fuel I would need to use to catch my monthly quota or the additional tackle I would lose fishing the shallower and much steeper small reefs near the beach.)

In the meeting we heard that the other proposal for protecting the Yelloweye was to cut all bottom fish limits by as much as 30%. The economic impact is easy on this one. If I catch and sell all of my Ling Cod each month, I earn $1300/month X 7 months = $9,100/year on Ling Cod alone. Every 1% cut in my Ling Cod quota equals $13/month or $91/year. A 30% cut of my yearly take will cost my small business $390/month of about $2730/year. With no salmon fishing this year, I had been counting on the money from Ling Cod to keep the business afloat. The loss of up to 30%?? An economic impact on my small business? Yes Sir!!

Thank You

Mark L. Roberts

Dear Chairman Hansen and members of the Council,

Thanks for the opportunity to comment on 2009-2010 groundfish regulations.

We seek fair and equitable allocation of impacts to overfished species: 50/50% split between rec and commercial sectors; 1/3 split between states.

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RFA members in California have consistently expressed an interest in more time on the water and would consider a lower bag limit on rockfish to achieve that.

We support a continuation of the shore-based angling and spearfishing exemptions to seasonal closures.

The proposed placement of Yelloweye Rockfish Conservation Areas in California would increase yelloweye impacts by shifting effort further away from ports. The economic impact to all ports in California north of Point Arena would be drastic. The fuel impacts to vessels would be staggering.

Council needs to consider "credit for areas closed" – over 90% of the yelloweye habitat is closed to fishing in the Rockfish Conservation Area. Perhaps the Science and Statistical Committee can analyze this huge rockfish reserve as a proxy for Annual Catch Limits or ACLs in directed groundfisheries on the West Coast.

Consider use of recompression devices as a way to improve survivability of released fish. Include a checkbox on CRFS sampling forms, to record whether or not anglers used these devices while fishing.

Sincerely

Kevin Mc Grath
P.O. Box 1
Redway,CA
95560

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The RFA supports the voluntary use of release devices on rockfish. We do not support regulations requiring them at this time.

Sincerely,

Tom Davies
P.O. Box 1164
Trinidad, CA 95570
(707) 677-3576

Dear Chairman Hansen and members of the Council,
I would like to add my email to the public comment for the groundfish Harvest Specifications for 2009-2010 Fishery scheduled in the June Council meeting:

First of all, I would like to comment on the allocation of over fished species such as the Yellow Eye rockfish. Since California is part of the three state recreational allocation with Oregon and Washington, it is only fair to have an equal split between the states. I am asking that you strongly consider an equal 1/3, 1/3, 1/3 split of the recreational allocation of the catch sharing options.

The next point is the proposed placement of Yellow eye Rockfish Conservation Areas in California. I would like to recommend that the Council consider that since our depth restrictions have moved the recreational fisherman inside to the 20 fathom line, this is inside the holding depths of the Yellow Eye. This would be about 90% of the yellow eye habitat is already closed to fishing. Why restrict any more area where the fisherman can fish. This is especially critical in Northern California as we have very few areas to where we can travel to enjoy our sport. Establishing more restricted fishing areas would severely impact our sport and the economy of the area.

Now with extremely high gas prices and a closed salmon season, our area is experiencing a large drop in people who would enjoy our coast and our fishery. More restrictions would only exacerbate the situation. According to the Magnuson-Stevens Fishery Conservation and Management Act that "Rebuilding plans must meet the mandate..." "to rebuild overfished stocks in as short a time as possible, while taking into account the status and biology of the overfished species, the socioeconomic needs of west coast fishing communities, and the interaction of the overfished stocks within the marine ecosystem." Please consider the "socioeconomic needs of west coast fishing communities."

Lastly we in Northern California have been promoting all winter that all anglers and charter boats carry recompression devices to improve survivability of released any fish. This year we are as a part of our equipment. This is not really an issue with most of us especially since we want to save our ability to fish our coast.

Thank you for you consideration in these matters.

Sincerely,

Bob Taylor
Eureka, CA.
email: bob@taysys.com

Don Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland OR 97220

Dear Sir:

Re: 2009-2010 Recreational Groundfish Regulations

As a concerned angler and also one concerned about the ecology, I just ask you to please choose a reasonable course in your recommendations for the groundfish regulations--one that not only strives to conserve the resource but that also permits the angler a decent access to his passion. Too much regulation these days, regardless of the subject, seems to involve one-sided, meat cleaver, over reaction type solutions. I encourage you to strike a fair balance in this issue.

It is very important to us that we continue to be able to pursue the one thing that gives us joy in this difficult world -- fishing and being out with nature. Don't take that away. I know your choices are difficult, but please do not underestimate the importance of what fishing means to so many of us.

Carl Richards
2718 Allenton Ave
Hacienda Hts., CA 91745

Executive Director Don McIsaac,

I am respectfully requesting a more equal share of the west coast yellow-eye (YE) allotment for California. I am unaware if OR and WA meet their allotment each year, but being we get shut down early nearly every year, I suggest a change is needed. We have a large number of residence and with the addition of salmon closures there is a significant target species switch to rockfishing. Shorter seasons are going to put the final nail in the coffin for many fishing realted businesses. I ask you to consider at least a 1/3 share of the allotment if not more. I would also urge a more current stock assessment. If we are catching so many I would suggest we may have a stock in better shape then previously believed. We have also had new depth restrictions in place this year, that will put off limits the majority of the yellow-eye population off our coast.

I thank you for your consideration,

Marc Schmidt
Eureka, CA

Thank you for the opportunity to provide testimony.

My wife and I live in the Humboldt Bay region and attended the May meeting for groundfish held by representatives of the Calif. Dept. of Fish and Game at Trinidad, CA. During the course of the meeting the concerns over yellow eye and canary rockfish were discussed in depth. The "take" concerns and where these two fish species are being caught were evaluated and discussed. It became very clear over the course of the meeting that while fish were being taken off Shelter Cove, Redding Rock and the north end of St. George's Reef. Trinidad, Cape Mendicino and the south end of St. Georges Reef were not areas of concern for take. The fishing community of both sport and commercial fisherman testified that in waters less than 200' they do not catch either of these two fish in our area. It would seem reasonable to target those areas of concern for these two species and not take a broad brush approach to closing whole coastlines and regions when these two species are only taken in few specied areas.

The DF&G representatives were clear that the PMFC does not consider or allow exclusions from their closure areas. We find that mystifying since Salmon closure areas and varying dates occur every year off the nothern california coast as compared to the southern areas. If this can be done for salmon, why not for groundfish? The economic damage created by total closures are devastating to our region. We rely heavily upon tourism and fishing to support our local economy. We consider a two month season for rockfish in the Humbodt Bay and Triniday region unnecessary and unreasonable. While we agree those imperiled species should be protected, to close an entire coastline is irresponsible and creates an economic burdon on our local economy. We ask that you examine your planned closure for this northern region and tailor closures where they are needed, and to allow longer seasons in those areas not affected. The scientific data should continue to be developed and boater educations is critical. Targeted management areas are certainly reasonable and would be supported by all those who fish offshore. We hope you will consider the impact on small communities and use available scientific data to produce the desired results without being overly burdensome.

Tom and Mary Marking
865 Stapp Road
McKinleyville, CA 95519

To: Don Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland OR 97220
Fax: (503) 820-2299
Email: pfmc.comments@noaa.gov

Re: 2009-2010 Recreational Groundfish Regulations

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Consider use of recompression devices as a way to improve survivability of released fish. Include a checkbox on CRFS sampling forms, to record whether or not anglers used these devices while fishing.

The RFA supports the voluntary use of release devices on rockfish. We do not support regulations requiring them at this time.

Sincerely,

Jan Zeiters
1867 William Ct.
McKinleyville Ca.

Qhy doesn't California get 1/3 of the allotment of yelloweye rockfish on the west coast. This has put a lot of people on the brink of starvation due to their inability to fish freely in their charter business. Please amend that rule and allow California to have a fair and balanced share of this fishery. The salmon season has already been devastating. Thank you

Cliff Hart
7074411906

I am curious why Oregon and Washington get 3/4's of the recreational yelloweye allocation. California apparently has a healthy yelloweye population,lots of anglers and lots of coastline. It seems that the only fair split between states would be 1/3 for each state. Please change the recreational allocation to a more equitable split. I also ask that a comprehensive stock assesment be performed on California yelloweye this year using nonlethal assesement methods such as submersables. It is the opinion of many anglers in Northern California that there is a substantial yelloweye population that has not been properly assesed. Thank You, Tim Klassen   Reel Steel Sportfishing. Eureka Ca

June 03, 2008

Dear Don McIsaac
PFMC Executive Director

Mr. McIsaak,
California needs a better split of the yellow eye rockfish between California,
Oregon and Washington. California gets a small percentage of the allocation but has the most abundant population of yellow eye per recent stock assessment. There is a huge disparity in yellow-eye by-catch among the three west coast states. California seems to rank at the bottom and yet the fishing effort is higher. California should have the highest allocation.

Please take action to correct this disparity and place California where it should
be with an equal share among the three states.

I am speaking for all 751 members of www.tunabite.com
Thank you
Dan Martin
CEO
www.tunabite.com

Hi John, I spoke with JoAnna Grebel of DFG today. I've been working with her to find a solution to my desire to have the 60 Fathom line coordinates off San Diego re-visited. She informed me that it will be presented to the council at the June meeting. I've put in countless hours communicating with her and others to get this right. The lines off San Diego are poorly drawn and in some cases cut off up to 1.7 miles of "legal" waters. I'm not asking for anything extra, just a realistic representation of the 60 fathom contour. The charts that have been submitted represent the actual boundaries. I have researched them in my own vessel and they have been confirmed by CA. DFG. Please consider this to be of the highest priority. Forcing me to fish shallow creates less economic opportunity and an unnessary interaction with juvenile fish. Please submit this email as public comment.
Thanks John Law

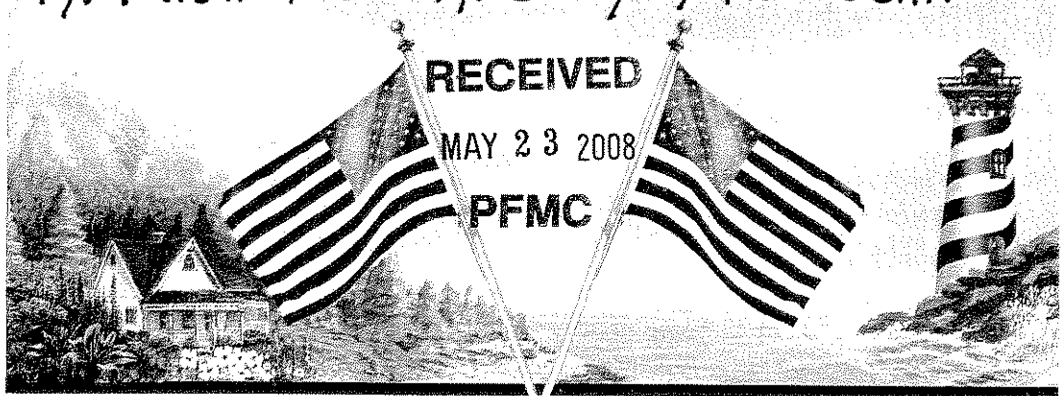
To whom it may concern,

California needs a better split of the yelloweye rockfish between California, Oregon and Washington. California gets a small percentage of the allocation but has the most abundant population of yellow eye per recent stock assessment. Please negotiate a fair percentage for California.

I am very concerned with the current in-equitable allocation of recreational Yelloweye between the states, and ask that the basis for the allocation be re-examined in light of historical catches, data, and stock status.

Best regards,
Greg Griffis

F/V IRISH-ROSE - F/V CURRY - F/V FRIENDSHIP

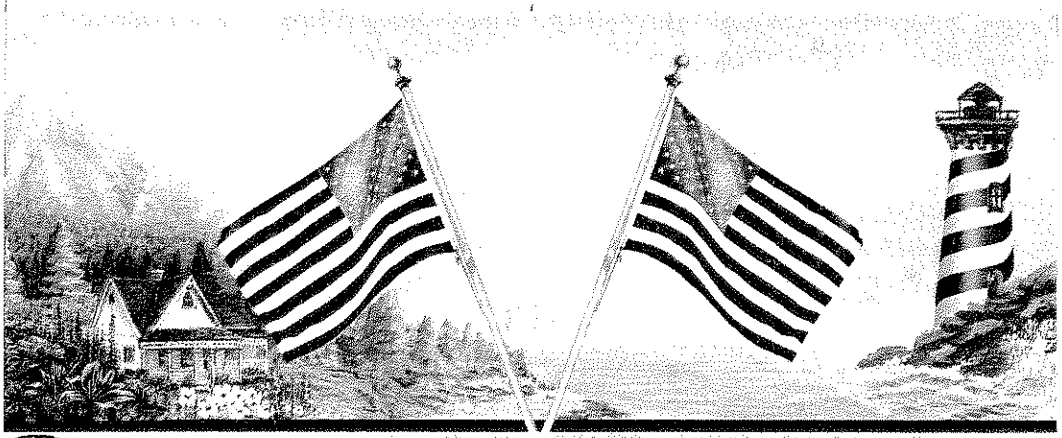

RECEIVED
MAY 23 2008
PFMC

John DeVore:

Hello - I am Mike Ashdown a Commercial Fisher in Port Orford Oregon. I own three F/V's with Nearshore Permits. There are three family heavily depending on the Product (Fish) from the Nearshore Fishery - Im hearing that because of yelloeye, that you might reduce quota 35% and move the Nearshore 30 fath line inshore more - I'm asking you to consider our Family's going broke if you do this. I am a Long Liner with an unindorsed "A" Permit & you can look up my Observer Data on F/V Irish-Rose - and see I don't catch yelloweye - If you moved the line into 25 fath - I could live with that. Because I dont go out deeper because of Canary's & yelloweye - Also I'v been thinking that you folk's should consider no long lining for Nearshore unless you have an "A" Federal Longline Permit

over

P2 MY THINKING ON THIS IS NOT FOR PERSONAL
GOALS AS TWO OF MY BOATS ARE OPEN ACESS.
AND MORE & MORE OPEN ACESS BOATS ARE
LONG LINEING NEAR SHORE, I'M HEARING THAT
THE CRESCENT CITY BOATS THAT ARE CATCHING
CANARY & YELLO EYE ARE LONG ~~LINES~~ OPEN
ACESS. I DON'T CATCH YE & C., I KNOW THAT
HERE IN SO ORE THERE ARE LOTS & LOTS OF COPPER
& QUILLS IN 30 FATH. BUT I DON'T GO THERE
BECAUSE I'M A PROFESSIONAL LONGLINER, &
MOST OPEN ACESS BOATS DON'T KNOW TO
STAY INSIDE OF 25 FATH. THERE SHOULD
ALSO BE A STAMP FOR "A" BOATS THAT QUALIFIED
LIKE BLACK COD - 1984 - 1994 - THAT WOULD
REDUCE EVEN FUTHER INTERREACTIONS
BETWEEN PROTECTED - BY QUALIFYING I MEAN
ANY YEAR 84-94 AN "A" PERMIT SHOULD LAND
AT LEAST 20,000 LB'S IN ONE QUALIFING
YEAR - I BET THERE IS NOT MANY WHO
QUALIFY -



P3 AGAIN I AM NOT TRYING FOR GAIN, BUT TRYING TO REDUCE CANARY & Y-E. CATCH. I USED TO CATCH MANY TONS OF ROCK FISH AND I KNOW WHAT TO LOOK FOR, AND AS I PASS OVER MANY SPOTS ON MY WAY TO FISH BLACK COD I CAN SEE THE R.C.A. OFF OF PORT ORFORD IS LOADED WITH FISH. I'M HOPING YOU WILL (NOAA) START A TAGGING PROGRAM FOR Y.E. & CAN. YOUR OB-SERVER'S ARE ALREADY WEIGHING & MEAS-URING ANY BYCATCH (WHY NOT TAG THEM AT THE SAME TIME? WE ARE RELEASING OUR BYCATCH ALIVE, AND YOU ARE WASTING A CHANCE TO TAG - I HOPE YOU WILL NOT REDUCE OUR QUOTA'S OR MOVE THE LINE IN BEYOND 25 FATH! IF YOU EVER WANT TO TALK ABOUT ALL OF THIS, I HAVE BEEN FISHING COMM. FOR 35 YRS NOW AND KNOW ALOT, I WOULD BE HAPPY TO TALK

PH#
2600494 THANK'S MIKE ASHDOWN

June 2, 2008

Pacific Fishery Management Council
Attn. John Devore
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

RECEIVED
JUN 0 2 2008
PFMC

Dear Council Members,

I want to make a few comments about the 2009-2010 near shore trawl fishery in the Cape Arago to Humbug Mountain area. The closure of this area in the 2007-2008 season has been a hardship on myself and 2 other small vessels that fish out of Charleston. This area is our most productive near shore area for Dover sole. The summertime catch rates for Dover in this area are much greater than they are North of Cape Arago. During the summer of 2007, myself and the other 2 small vessels never came close to catching our 2 month quotas of Dover inside of 75 fathoms.

I would urge the council to open up the Cape Arago to Humbug Mountain near shore area for the 2009-2010 seasons. I also would like to see the boundary line moved out to 100 fathoms for as much of the summer as possible. The catch rates per hour increase 3 or 4 times between 75 to 100 fathoms over what they are inside of 75 fathoms. Most of the time we are on a 7,500 pound plant trip limit for Dover during summer months. Being able to fish out to 100 fathoms lets us catch this limit in one day or less. Inside of 75 fathoms it usually takes 2 full days to catch the same amount. In today's high cost of fuel, this can make or break us. This also cuts down on by-catch and discards.

I have a 42' vessel (F/V Apache) that does not have the capability to safely fish offshore. The 3 boats that normally fish the near shore area on the south coast of Oregon, work from about April 15th to the end of October.

I wanted to comment on the selective flat fish trawl. This has been a great success in my opinion. It works extremely well for flat fish and seems to catch sablefish fairly well. In July and August when the whiting are thick in the near shore areas, we are able to fish with almost zero by-catch of whiting. In the days of the overhang nets, sometimes we could not deal with the by-catch of whiting. In 2005, I landed 120 pounds of Canary's and in 2006 I landed 200 pounds total for the whole summer. The selective flat fish trawl is a great tool. My fuel consumption decreased 25% when I began using this net.

Respectfully,

Tom Nowlin
F/V Apache
1570 Woodland
Coos Bay, OR 97420

To: Don Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland OR 97220
Fax: (503) 820-2299
Email: pfmc.comments@noaa.gov

RECEIVED
JUN 0 2 2008
PFMC

Date: May 2, 2008

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The RFA supports the voluntary use of release devices on rockfish. We do not support regulations requiring them at this time.

At the meeting in Trinidad on May 1st I circulated a petition to the folks who attended the meeting on a equal split of allotment for Yelloweye rockfish between states on the west coast
Sincerely
Kevin Mc Grath
P.O. Box 1
Redway,CA
95560

5/1/08

We ask that the PFMC raise our Yelloweye quota to equal that of Oregon and Washington

Kevin McGrath PO Box 1 Redway CA 95560
Stephen Linton 1659 Short St McKinleyville, CA 95519

Dennis Mayo McKinleyville Ca. 95519.
Donny Oai Trinidad CA. 95570
[illegible] Crescent City Ca 95531
Karen Barlow Crescent City Ca 95531
Mawrie Moser Trinidad CA 95519
Robert Stepp " " 95570
Randy Martinez " Ca 95570
Irene Martinez " " "
[illegible] McKinleyville CA 95519
[illegible] Klassen Eureka Ca 95503
Karen R Zeni McKinleyville 95519
Randy Sundberg 122 [illegible] McKinleyville 95519
Steve Jones 3741 Dows Prairie Rd McK. CA 95519
Mike Zamboni 1341 Bel Nor Rd McKinleyville
Khevin mellegas 4475 central Ave mckinleyville ca 95519
MATT DALLAM 960 CRANNELL Rd. TRINIDAD, CA 95570
Harrison Ibach 1736 A Ave. McKinleyville, CA 95519
Louis Robinette 3410 Park st Eureka Ca 95501-1548
AARON LIPPOW 1449 CENTRAL McKinleyville CA 95519
Brendan Summers 839 Liscom Hill Rd Arcata CA 95521
Micah Woolworth 4245 Dows Prairie Road McKinleyville CA. 95519
Craig Goucher 1830 pickett Rd. McKinleyville, Ca. 95519

Also could you please increase the depth limit on Petrale sole to that of California Pacific Halibut because of ~~the~~ fact that they are caught in the same areas

Sincerely
Kevin B McGrath
PO Box 1
Redway, CA
95560

F- 4

F/V Timmy Boy
Denny Burke
9618 SE Birch St.
South Beach, Or. 97366

May 30, 2008

Pacific Fishery Management council
7700 NE Ambassador Place, Suite 101
Portland, Or. 97220

To council members & NMFS:

I want to express my concern over the 2009-2010 Sable fish OY. I am grateful for the raise, but am concerned about the distribution of so much fish to the south. The majority of fish are landed north of Monterey, Ca. yet under the preferred option; the northern fishermen receive only a 23.2% increase.

While south of conception the OY goes from 210 tons to 1371 tons an increase of over 5 times. To avoid effort shift or the danger of new fishers targeting a fish that is being harvested already, perhaps some of the 1161 tons going south of conception could be added to the north making the increase more equitable in both areas.

500% increase south and 23.2% increase north is wrong.

Thank you,

Denny Burke

The Washington Trollers request the following salmon/lingcod bycatch landing allowance is allowed to go forward for consideration in the 2009/2010 groundfish management regulations. First, a few points to consider:

The Salmon Trollers claim that this allowed bycatch will not lead to targeting of lingcod. Our best proof is the situation with halibut where a very small percentage of the salmon landings (I would guess that less than 1% of the total landings) by the fisherman include the maximum amount allowed of halibut. Halibut is more valuable than ling cod which would indicate less incentive to target lingcod if an individual is not targeting the more valuable halibut.

Similar to the previous point, the average salmon are in excess of $70 per fish where a ling cod will likely be close to $12 per fish. Currently, why would a person waste time pursuing a significantly lower value fish? From the WDFW analysis you will see that bulk of the landings of chinook salmon by the Trollers between 2005 and 2007 were less than 50 chinook per landing. This would mean at a 1 ling plus 1 ling to 15 chinook landing allowance, with the likely historic encounter of 1 ling to 7 chinook or 1 ling to 30 chinook, there would only be potentially 3 ling available to target. At the average price of $1.24/pound for the ling and an average weight of 10 pounds, the three ling would potentialy represent $37.20. With feul at $4.40/gal., that would not likely cover the cost of the additional feul required.

We know that the yelloweye are the groundfish of most concern. We also know that yelloweye are very sedentary around rocks as compared to canary and lingcod. Like the trawlers, the salmon trollers do not concentrate their effort exceptionally close to the rocks due to fear of catching rocks and losing gear(Currently, our lead cannon balls that trollers use cost over $100 each.). This is also different than the recreational fishery as the salmon troller is constantly moving as compared to the recreational fishery where they will anchor or drift on rock piles.
In addition to the above, there is additional protection for yelloweye rockfish that only applies to the salmon troll fleet. The closed areas include the mushroom closed area that covers several hundred miles off of Cape Flattery and another approximimately 8 square mile area off of La Push WA. Both of these areas are know for high abundance of yelloweye rockfish.

There are observed salmon trolling trips on the WA coast that show incidental hooking of lingcod while trolling for salmon that often exceed one ling cod for every 10 salmon.

As a reminder, the Magnuson Act encourages reduction of bycatch whenever practical.

Having said the above, we propose the following landing allowance of lingcod with our salmon deliveries as a retention of the incidental encountered lingcod while salmon fishing:

One lingcod plus one lingcod for each 15 chinook salmon that are in possession up to a maximum 10 lingcod per delivery of salmon and not to exceed 400 lbs. per month.

RESOLUTION NO. 2008-035

A RESOLUTION OF THE DEL NORTE COUNTY BOARD OF SUPERVISORS DECLARING THE AREA OF STATE WATERS FROM THE MOUTH OF THE KLAMATH RIVER TO THE MOUTH OF SMITH RIVER AN OCEANOGRAPHIC AREA OF UNIQUE ECONOMIC IMPORTANCE TO DEL NORTE COUNTY

WHEREAS, The fishing community of Del Norte County is a historic and important present day contributor to our economic base. Along with dollars generated directly from fishing, our harbor and its fishermen create a destination for sport fishermen and seafood lovers, increasing our counties revenue; and

WHEREAS, Since the reduction in our off shore fleet through federal actions, most of our fishery dollars are now generated from our near shore state waters. Because of our local weather patters, ocean fishermen who work and play in our county must fish close to our port or risk injury; and

WHEREAS, This makes the state waters from the mouth of the Klamath River to the mouth of Smith River of the highest economic importance to our county's fishing community. At this time there are no species of near shore finfish listed as over-fished by the federal or state government. In 1998, the federal government decreased the overall fishing effort, creating conditions that have the area currently rebuilding all near shore species through historically high protection levels; and

WHEREAS, This high level of protection has already cost our county through fishery reductions, and has brought our fishing infrastructure close to the point of collapse. Thus, any farther reductions may collapse our fishing community; and

WHEREAS,. Any closures of this area will be fought with the highest degree of effort available to our county. We also ask that any regulatory managers of these waters take our counties reliance of above-mentioned area and maintain our fishermen's access to it.We do this because we understand the importance of our fisheries to our county's economic base; and

NOW, THEREFORE, BE IT RESOLVED, that the Del Norte County Board of Supervisors, hereby declares the area of state waters from the mouth of the Klamath River to the mouth of Smith River an oceanographic area of unique economic importance to Del Norte County.

PASSED AND ADOPTED this 27th day of May, 2008.

Ayes: Supervisors Hemmingsen, Sullivan, McClure, McNamer, Finigan
Noes: None

David Finigan, Chair
Del Norte County Board of Supervisors

F.4.D

The Daily Triplicate

y.triplicate.com | Informing the community since 1879 | Del Norte Court

TUESDAY
MAY 13, 2008

IN FOCUS: OVERDUE DREDGING

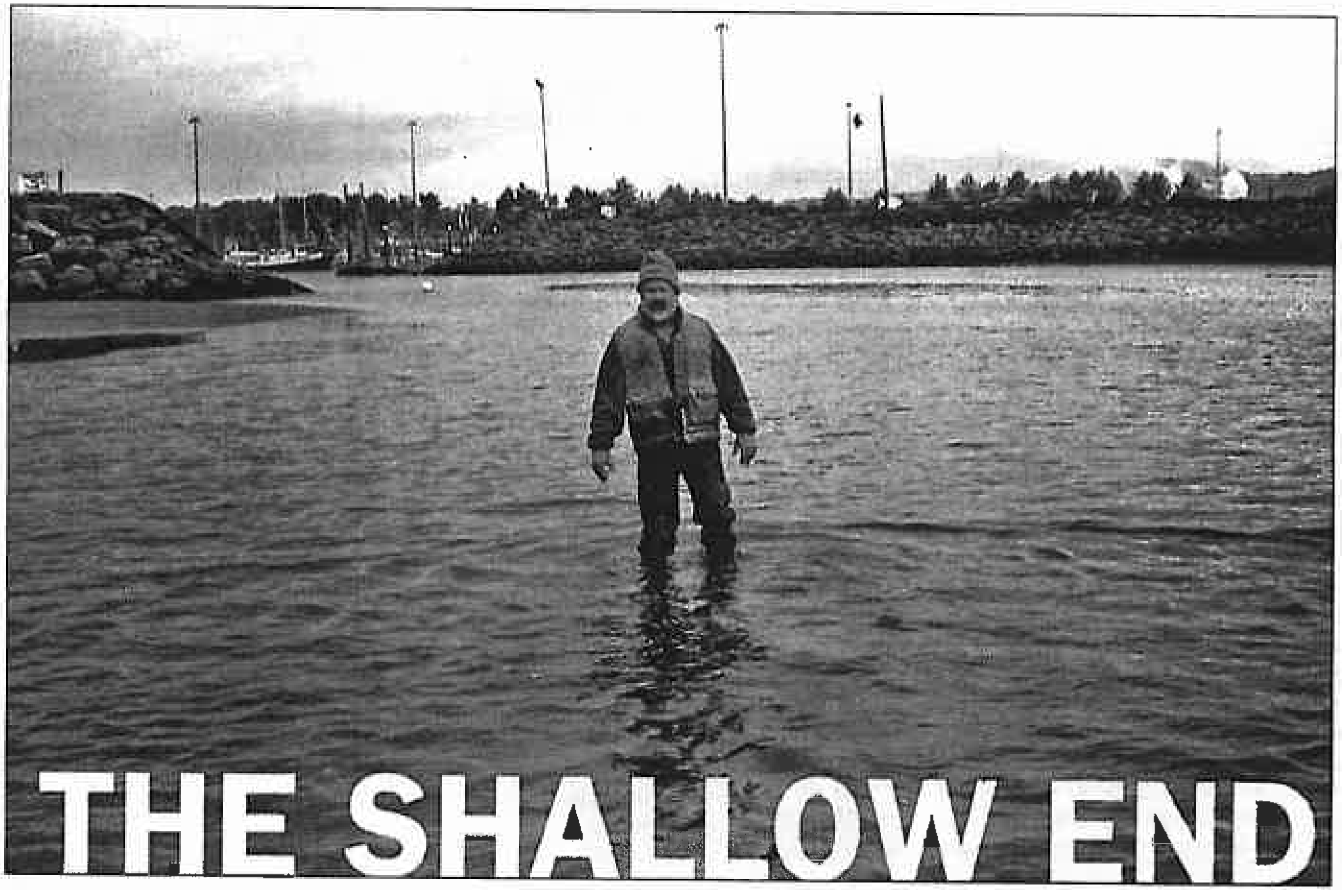


Photo by Crescent City Harbor District

Crescent City Harbor Facilities Manager Paul McAndrews stands knee-deep in the federal channel that leads to the inner boat basin last month. The channel is supposed to be 15 feet deep, but sediment and materials from the ocean have washed into the channel the past eight years, fueling an ever-growing need for dredging.

As channel fills with sediment, harbor navigation gets trickier

By Michelle Ma
Triplicate staff writer

Early last month, local fisherman Victor Pomilia untied his boat, preparing to leave the harbor on a fishing trip.

As he motored out of the boat basin, Pomilia's Spirit of America vessel stalled in shallow water, dragging on the muddy bottom. His boat had run aground in the federal channel.

"I knew it was shallow and I knew it was getting worse," said Pomilia, whose boat draws down more than 6 feet. The fisherman backed up and waited for the tide to come in.

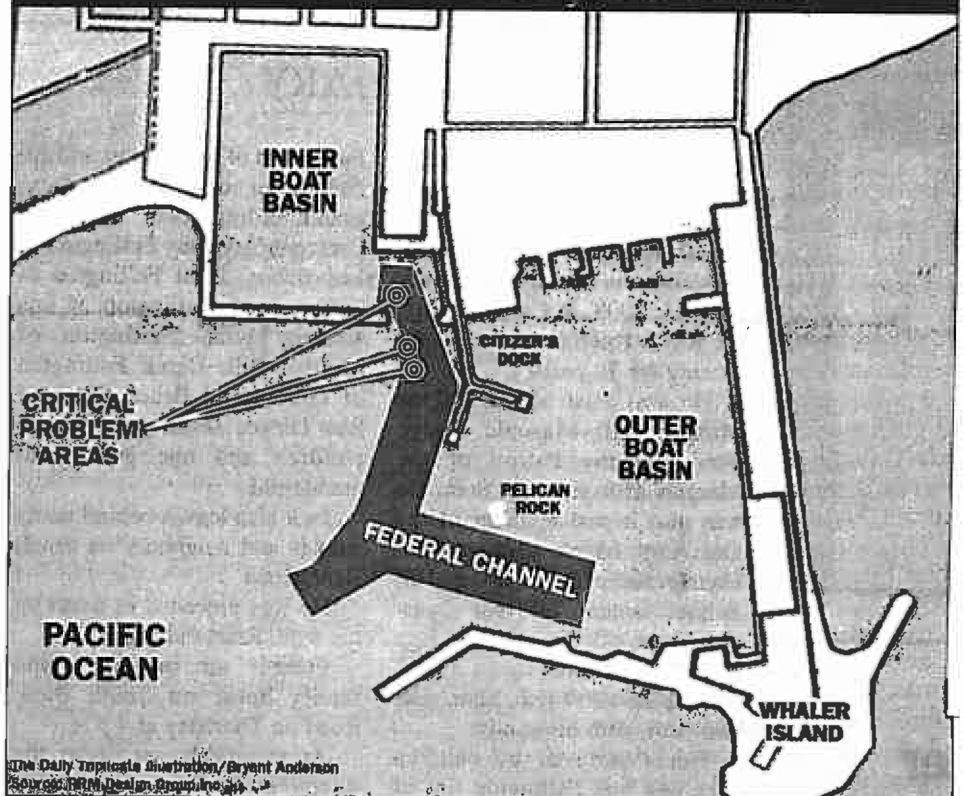
Pomilia, who knows how to maneuver around the harbor's shallow spots in low waters, was caught off-guard. Only a month before, he had successfully left the harbor under similar conditions.

"It was a minus tide, but I'd been able to slip by before," Pomilia said. "It's just proof that the harbor has been filling in."

Many local fishermen have reported similar groundings as they enter and exit the boat basin. Even the Lady

See DREDGING, A3

CRESCENT CITY HARBOR DREDGING



The Daily Triplicate illustration/Bryant Anderson

The U.S. Army Corps of Engineers must dredge the harbor's federal channel, which leads to the inner boat basin. Adequate funding hasn't been secured for the dredging project, and the channel has filled with sediment over the past eight years. Fishing boats have run aground in the 'critical problem areas.' The harbor is responsible for dredging the inner and outer boat basins.

LOCAL

Harbor raises moorage rates after passing lean budget

By Michelle Ma
Triplicate staff writer

Harbor commissioners Tuesday confirmed last week's decision to raise all moorage rates to help pay for utilities, repairs and maintenance in the harbor.

A 10-percent increase in slip rental fees would apply across-the-board to all boats that dock in the Crescent City harbor's inner and outer basins. Harbor staff recently surveyed regional ports and found the rate increase to be comparable to what other harbors charge for vessel moorage, said Harbormaster Richard Young.

An ordinance must be written and passed before rates will rise, but the extra charge will probably be instated later this summer, officials said.

The decision to raise rates came alongside commissioners' grim approval of next fiscal year's preliminary budget. Commissioners and staff met last Friday afternoon to piece together the leanest Harbor District budget they could manage, commissioners said. They examined each line item last week, and confirmed Tuesday that nothing more could be cut.

"Everything (on the budget) is a necessity," said Commissioner Garry Young as he flipped through the budget during Tuesday's meeting. "We've trimmed it as much as we can trim."

Several new purchases—including a new electrical cabinet needed to maintain power throughout much of the harbor—are vital to the harbor but costly to absorb, commissioners said.

Officials said they need to find ways to increase revenue to the harbor, especially as expenses continue to rise. One likely source is rental revenue from a new sandwich shop slated to open soon in the harbor.

The final budget will likely be adopted at the board's July 1 meeting. A copy of the early budget is available for public review in the harbor office.

In other news, the harbor's log-cabin-look-alike RV park project will go before the Del Norte County Planning Commission tonight. Even if the harbor gets a use permit from the county, more permitting must be done before the project can go forward, Harbormaster Young said.

Reach Michelle Ma at mma@triplicate.com.

Dredging

Continued from A1

Washington, a tall-masted ship that recently visited Crescent City, touched bottom in the harbor.

The harbor's federal channel that stretches along Citizen's Dock to the inner boat basin hasn't been dredged in eight years. The U.S. Army Corps of Engineers recommends that it be dredged on a five-year cycle, but Congress hasn't appropriated enough money to complete the project.

Crescent City Harbor commissioners recently approved a letter asking Del Norte County Board of Supervisors to declare a local emergency to address the need for dredging. County supervisors will likely approve this declaration at today's meeting in Klamath, thus forwarding the request to the Governor's Office of Emergency Services.

If the state affirmed the emergency declaration, California could pay for 75 percent of the dredging project's

of it at all."

For a commercial fishing port that usually brings in about $15 million a year to the local economy—close to $20 million in good years—officials agree it would be disastrous to lose the harbor, let alone restrict any further fishermens' business due to shallow waters.

Crescent City Harbor has always been known for its rich, abundant fishing industry. Other state and federal restrictions, combined with a decline of some significant fisheries, have already burdened the local fleet of about 100 commercial fishing boats and nearly 70 recreational vessels.

"This is the highway to the

included in the federal government's yearly budgets.

Many smaller, shallow ports along the coast of California, Oregon and Washington are in great need of being dredged, much like Crescent City, said Steve Chesser, dredging program manager for U.S. Army Corps of Engineers, San Francisco District, and former project manager for the Crescent City dredging project for the Corps.

But up and down the coast, it's the same story—funding is hard to come by, Chesser said.

"It really puts the congressional folks on the spot, because they have a lot of competing interests," Chesser said.

federal government, said Harbormaster Richard Young.

Fishermen, harbor officials and government representatives recognize that a shallow-access channel could effectively stop boats from entering or exiting the harbor and hurt the local economy.

"We're trying to do everything we can to help acquire funding for that project," said Del Norte County Supervisor Gerry Hemmingsen, who also fishes out of the harbor. "It's pretty inconvenient and dangerous. I think we need to make the case that this is an emergency."

Economic Implications

If no action is taken to remove the sediment that continues to fill the harbor's access channel, the local fleet of fishing boats could be forced to dock elsewhere. Already, many local fishermen must watch the tides to plan when it's safe—and possible—to enter or exit the boat basin. For some boats, low or minus tides almost always guarantee hitting bottom in the access channel, forcing fishermen to wait until it's safe to move.

"We have to operate everything around the tide," said David Evanow, a local fisherman.

Evanow said his large boat, the Darin Alan, and his smaller one that draws down about 4 feet, have both run aground in the harbor's access channel. It used to be just the larger, deeper-drawing vessels that would hit bottom, Evanow said, but now smaller boats also have problems.

"At a low tide, it's frightening how bad it is," Evanow said. "If this harbor keeps going as it is ... said. "There really will be a disaster if this harbor doesn't function anymore."

Waiting on Congress

Funding to dredge the harbor's federal channel must now come from Congress through an appropriations process. Years ago, dredging for shallow coastal ports such as Crescent City used to be included in the president's budget, but the projects now require Congress to request specific funding.

The Army Corps estimates it will probably cost $2 million to $3 million to dredge Crescent City's federal channel, depending on where the material is disposed. Once that money is available, the Army Corps can then contract out to complete the dredging project.

Even though dredging the federal channel is at least three years overdue, only about $556,000 is currently available for Crescent City dredging, said Liz Murguia, district representative for U.S. Rep. Mike Thompson, who is trying to secure additional money for the work. The Democratic congressman has requested $2.3 million in the 2009 fiscal year appropriations process, but it remains to be seen if the funds will be secured, Murguia said.

"It is a top priority for the congressman, but there are numerous hurdles to securing the funds—not the least of which is whether or not there will be any congressional earmarks in this year's budget," Murguia said in an e-mail.

Fort Bragg's harbor is another shallow-water port within Thompson's district that needs congressional funding to be dredged, Murguia said. Funds to dredge deep-water commercial ...

Sediment keeps coming

All parties involved are considering a short-term solution to dredge only the most shallow parts of Crescent City's federal channel. The Army Corps might be able to hire the local Harbor District through a contract to dredge the problematic spots.

The harbor has a dredge that staff uses to remove material from the inner and outer boat basins. But dredging the federal channel is the federal government's responsibility, Harbormaster Young said, so it's important that the harbor doesn't set a precedent of dredging the federal channel with local money.

As sediment and materials from the ocean have washed into Crescent City Harbor, a channel designed to be 15 feet deep has filled in to depths shallower than 3 feet in some locations. The Army Corps recommends removing about 100,000 cubic yards of material every five years, and now an estimated 174,000 cubic yards of material await removal.

Vessels entering and leaving the boat basin must take turns maneuvering along the inbound side of the channel to avoid shallow spots by the sea wall. But when tides are low, all parts of the channel are shallow, fishermen said.

This would present a problem if all boats needed to evacuate the inner basin because of a fire or tsunami during a low tide. Similarly, if boats need to seek shelter in the harbor, they might not be able to enter if the channel is too shallow.

"It's a dangerous harbor right now," said Pomilia, the fisherman who owns Spirit of America.

The U.S. Coast Guard Cutter Dorado docks out by Whaler Island, but must enter the federal channel's shallower section to fill up at the fuel dock along Citizen's Dock. The boat hasn't come close to running aground, but the Dorado's captain, Lt. Chris Weber, said he must watch the tides to know when the channel is deep enough for the cutter to tie up by the fuel dock.

Weber said he plans to send a "high priority" internal memo to recommend that the harbor's federal channel be dredged for the safety of the Coast Guard's rescue missions, enforcement and patrol. The memo will try to gain support from the Coast Guard to work toward getting ... more quickly, Weber said.

"My concerns are ensuring we can respond at any time," Weber said. "With that mission in mind, that's where my concerns arise."

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SURVIVAL TOO
GOLD COAST
WHITE STAR


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Agenda Item F.5
Situation Summary
June 2008

CONSIDERATION OF INSEASON ADJUSTMENTS

Management measures for the 2008 groundfish season were set by the Council with the understanding these measures would likely need to be adjusted throughout the biennial period to attain, but not exceed, the optimum yields (OYs). This agenda item will consider inseason adjustments to ongoing 2008 fisheries.

The Groundfish Management Team (GMT) and the Groundfish Advisory Subpanel (GAP) will meet prior to this agenda item to discuss and recommend inseason adjustments to ongoing 2008 groundfish fisheries. After hearing this advisory body advice and public comments, the Council will consider preliminary or final inseason adjustments. Agenda Item F.8 is scheduled for Thursday, June 12, should further analysis or clarification be needed.

Council Action:

1. Consider information on the status of 2008 fisheries and adopt preliminary or final inseason adjustments as necessary.

Reference Materials:

1. Agenda Item F.5.e, Public Comment

Agenda Order:

a. Agenda Item Overview — Merrick Burden
b. Report of the Groundfish Management Team — Robert Jones
c. Agency and Tribal Comments
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action:** Adopt Preliminary or Final Recommendations for Adjustments to 2008 Groundfish Fisheries

PFMC
05/22/08

Agenda Item F.5.b
Supplemental GMT Report
June 2008

GROUNDFISH MANAGEMENT TEAM (GMT) REPORT ON
CONSIDERATION OF INSEASON ADJUSTMENTS

The Groundfish Management Team (GMT) considered the most recent information on observer bycatch rates from the 2006 Total Mortality Report and the status of ongoing fisheries and provides the following considerations and recommendations for 2008.

RECREATIONAL

Projected catches for all of the 2008 recreational fisheries could be affected by the poor salmon season. The states will be monitoring catches inseason to see if inseason adjustments are necessary to mitigate effects that the salmon season may cause.

California
In 2007, the California recreational fishery north of Pigeon Point was closed inseason on October 1, due to higher than expected impacts of yelloweye and canary rockfish. The estimated impact on yelloweye rockfish was 8.0 mt compared to the 2.1 mt harvest guideline. There was sufficient "buffer" in the 2007 scorecard to offset the overage and no other Council fisheries were affected by the overage.

Subsequent to the March and April Council meetings, CDFG announced that the YRCAs would not be implemented due to concerns regarding impacts on fishing opportunities from the salmon closure. CDFG was also concerned about the efficacy of the proposed YRCAs in reducing yelloweye catch as action could only be taken in state waters without their inclusion in a Federal Environmental Impact Statement. Instead they have taken the following management measures:

- Instituted the 20 fm depth restriction in the Northern and North-Central Management Areas.
- Initiated a comprehensive outreach and education program on yelloweye and canary rockfish identification and prohibition on take.
- Implemented methods to track the cumulative sampled catch and relate it to the corresponding estimated catch in previous seasons. Sampled catch will be reported with a one week lag to provide early warning of impending need to close the fishery.
- Use of California Recreational Fishery Survey yelloweye and canary catch estimates on a one month lag (rather than a two month lag as in the past) to provide confirmation of the early warning and for use in determination of the need for action to close the season.

CDFG presented to the GMT their new methods for tracking inseason catch and monitoring it against previous seasons. During the period between the June and September Council meetings CDFG could, if necessary, take action to close the fishery in state waters, which makes up the vast majority of waters open under the 20 fm depth restriction. Even with the new tracking system, the inseason state process may still take up to one month. The Council could take conforming action at the September meeting to close the fishery in federal waters if necessary. CDFG has reviewed the current cumulative sampled catch and based on the revised catch tracking system believes there is no need to take inseason action at this time.

Oregon
No changes are proposed for the recreational fisheries in Oregon.

Washington
No changes are proposed for the recreational fisheries in Washington.

The GMT notes that, unlike 2007, there is very little OY remaining in the coastwide yelloweye rockfish scorecard as of April 2008 (1.5 mt). If yelloweye rockfish impacts in the recreational fishery exceed the harvest guideline in 2008, the Council may be faced with fewer options than were available in 2007.

COMMERCIAL

Limited Entry Non-Tribal Whiting Trawl
At this meeting the Council requested that the GMT examine canary bycatch in the Limited Entry whiting fishery. To date the at-sea sectors are estimated to have taken over 2.4 mt of canary as bycatch (out of the 4.7 mt bycatch limit). The estimated catch of whiting through June 8 is 60,741 mt.

It is difficult to project bycatch into the near future and even more difficult to project bycatch through the rest of the season. This is especially the case for widow rockfish. The catch of widow rockfish is highly sporadic while the catch of darkblotched appears to be less sporadic. Canary rockfish bycatch appears to be moderate to the two species. Since the implementation of bycatch limit management in 2004, at least two canary events have occurred which could be described as “disaster tows”, but outside those two events, the catch of canary has been relatively steady, though perhaps increasing year over year.

It is the GMT’s understanding that currently NMFS can only close the fishery upon attainment of the bycatch limit for any overfished species. This means that if the canary rockfish bycatch limit were met, additional catch is likely to occur before the fishery is closed; the amount of such an overage is not possible to estimate at this time.

It is the GMT’s belief that the recent events do not substantially change the facts surrounding management of the Pacific whiting fishery. The potential of a bycatch limit overage and the repercussions of such an overage have been discussed repeatedly since the September 2007 Council meeting. As currently structured, attainment of a bycatch limit over the summer would result in the closure of the Pacific whiting fishery. If an overage has occurred, action could be taken at the September meeting to further restrict canary rockfish catch, if necessary. **Therefore, the GMT recommends that the Council take no action at this time and revisit this issue at**

the September meeting to examine whether further action is needed based on the progression of the fishery in relation to bycatch limits.

Limited Entry Non-whiting Trawl Fishery

The catch of several trawl target species has been tracking behind projections made at the March 2008 Council meeting. Sablefish and Other Flatfish in particular have been several hundred tons below predicted catch levels for the first half of the year. Other target species such as Dover sole, thornyheads, and arrowtooth flounder are tracking closer to projections or are exceeding projections but are expected to come in below OYs for the year without any adjustment to RCAs or cumulative limits. The one exception is for petrale sole. The catch of petrale sole during period one was nearly 1,000 mt which was higher than expected. Most of this catch came from the northern areas. Based on existing projections, the OY of petrale sole could be exceeded by a minor amount if no inseason action is taken. The estimated catch of overfished species does not appear to be at a level that would jeopardize exceedance of an OY.

Available data and anecdotal information from industry indicates that catches of many target species have begun transitioning from areas seaward of the RCA on the slope to areas shoreward of the RCA. If Dover sole is a guide, the catch rate of Dover sole in the north has slowed, indicating that those species are less available to trawlers using large footrope gear seaward of the RCA where the limits are relatively large. Although target species have begun transitioning from the deeper depths, target species are expected to remain available at those deeper depths through the summer months, though to a lesser degree.

In the north, logbook data indicates that vessels operating off Northern California to Central Oregon can access target species at depths greater than 200 fm, while vessels operating further to the north appear to have more difficulty accessing target species at those same depths. In order to allow access to deepwater target species, the Council, at its March meeting, elected to approve a seaward boundary of 150 fm north of Cape Falcon and 200 fm between Cape Falcon to 40°10’ N lat. for much of the year. While this measure may result in higher impacts on darkblotched and POP than would be the case if a 200 fm line was implemented for the entire coastal area, the catch of darkblotched rockfish and POP appears to be within levels that do not jeopardize exceedance of an OY. Therefore, there does not appear to be reason for considering more restrictive seaward RCA boundaries.

In the shoreward areas north of 40°10’ N lat., a 60 fm RCA boundary was put in place for much of the year off Washington, southern Oregon, and northern California in order to protect canary rockfish. This fathom restriction is expected to restrict access to target species in those areas – petrale sole in particular – and restrict fishing opportunity for vessels that rely heavily on areas shoreward of the RCA in those areas. However, liberalizing the RCA in those areas is expected to result in canary impacts that would risk an exceedance of the canary OY. Therefore, liberalization of shoreward RCA boundaries was not considered.

In areas south of 40°10’ N lat. catch of several target species has been lagging behind projections except for slope rockfish. Therefore, some liberalization of fishing opportunity in the south could likely be accommodated, however the fact that the projected take of canary rockfish in the most recent scorecard is equal to the OY means that southern opportunities are also limited by canary even though the bycatch rate is substantially lower than in the north.

Based on the above factors, the GMT would like to forward the following two options for Council consideration. Proposed changes are in enlarged and italicized font. In option 1, opportunities are increased, except for petrale sole where opportunities during period 5 are decreased by 3,000 lbs per two months (to 14,000) with selective flatfish gear in the north and in period 6 where opportunities are decreased by 5,000 lbs per two months coastwide. Increases are proposed for sablefish coastwide, for Dover sole with selective flatfish gear in the north, for Other Flatfish with selective flatfish gear in the north. Increases for target species opportunities for vessels using selective flatfish gear are intended to off-set the reduction in petrale opportunities, but are limited by the amount of canary rockfish available in the scorecard. No changes are proposed to RCA boundaries.

In option 2, no adjustments are made to petrale sole opportunities in the southern trawl fishery. In the north, petrale sole opportunities are set at 30,000 lbs per 2 months in period 6, and at 16,000 lbs in period 5 for vessels using selective flatfish gear.

Table 1 Cumulative Limits for Option 1

SUBAREA	Period	INLINE	OUTLINE	Sabl	Longsp	Shortsp	Dover	Otr Flat	Petrle	Arrowtth	Slope Rk
	1			14,000	25,000	25,000	80,000	110,000	40,000	150,000	1,500
N 40 10	2			14,000	25,000	25,000	80,000	110,000	30,000	150,000	1,500
Large	3	No Change from		19,000	25,000	25,000	80,000	110,000	20,000	150,000	1,500
Footrope	4	Status Quo		*24,000*	25,000	25,000	80,000	110,000	20,000	150,000	1,500
	5			*24,000*	25,000	25,000	80,000	110,000	20,000	150,000	1,500
	6			*19,000*	25,000	25,000	80,000	110,000	*35,000*	150,000	1,500
North SFFT	1			5,000	3,000	3,000	40,000	70,000	10,000	10,000	1,500
	2			5,000	3,000	3,000	50,000	70,000	18,000	10,000	1,500
	3	No Change from		5,000	3,000	3,000	40,000	50,000	18,000	10,000	1,500
	4	Status Quo		*7,000*	3,000	3,000	*50,000*	*80,000*	18,000	10,000	1,500
	5			*7,000*	3,000	3,000	*50,000*	*80,000*	*14,000*	10,000	1,500
	6			*7,000*	3,000	3,000	*50,000*	*80,000*	10,000	10,000	1,500
38 - 40 10	1			14,000	25,000	25,000	80,000	110,000	50,000	10,000	15,000
	2			14,000	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	3	No Change from		19,000	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	4	Status Quo		*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	5			*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	6			*19,000*	25,000	25,000	80,000	110,000	*45,000*	10,000	15,000
S 38	1			14,000	25,000	25,000	80,000	110,000	50,000	10,000	55,000
	2			14,000	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	3	No Change from		19,000	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	4	Status Quo		*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	5			*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	6			*19,000*	25,000	25,000	80,000	110,000	*45,000*	10,000	55,000

Table 2 Cumulative Limits for Option 2

SUBAREA	Period	INLINE	OUTLINE	Sabl	Longsp	Shortsp	Dover	Otr Flat	Petrle	Arrowtth	Slope Rk
	1			14,000	25,000	25,000	80,000	110,000	40,000	150,000	1,500
N 40 10	2			14,000	25,000	25,000	80,000	110,000	30,000	150,000	1,500
Large	3	No Change from		19,000	25,000	25,000	80,000	110,000	20,000	150,000	1,500
Footrope	4	Status Quo		*24,000*	25,000	25,000	80,000	110,000	20,000	150,000	1,500
	5			*24,000*	25,000	25,000	80,000	110,000	20,000	150,000	1,500
	6			*19,000*	25,000	25,000	80,000	110,000	*30,000*	150,000	1,500
North SFFT	1			5,000	3,000	3,000	40,000	70,000	10,000	10,000	1,500
	2			5,000	3,000	3,000	50,000	70,000	18,000	10,000	1,500
	3	No Change from		5,000	3,000	3,000	40,000	50,000	18,000	10,000	1,500
	4	Status Quo		*7,000*	3,000	3,000	*50,000*	*80,000*	18,000	10,000	1,500
	5			*7,000*	3,000	3,000	*50,000*	*80,000*	*16,000*	10,000	1,500
	6			*7,000*	3,000	3,000	*50,000*	*80,000*	10,000	10,000	1,500
38 - 40 10	1			14,000	25,000	25,000	80,000	110,000	50,000	10,000	15,000
	2			14,000	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	3	No Change from		19,000	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	4	Status Quo		*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	5			*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	15,000
	6			*19,000*	25,000	25,000	80,000	110,000	50,000	10,000	15,000
S 38	1			14,000	25,000	25,000	80,000	110,000	50,000	10,000	55,000
	2			14,000	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	3	No Change from		19,000	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	4	Status Quo		*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	5			*24,000*	25,000	25,000	80,000	110,000	30,000	10,000	55,000
	6			*19,000*	25,000	25,000	80,000	110,000	50,000	10,000	55,000

Table 3 Trawl Rockfish Conservation Area Boundaries North of 40 deg 10 min N lat.

<table>
<tr><th>Lat Area</th><th>Name Area</th><th>Jan - Feb</th><th>Mar - Apr</th><th>May - Jun</th><th>Jul - Aug</th><th>Sept - Oct</th><th>Nov - Dec</th></tr>
<tr><td>North of 48 10 N lat</td><td>N Alava</td><td>shore - 200*</td><td>shore - 200</td><td colspan="3">shore - 150</td><td>shore - 200*</td></tr>
<tr><td>48 10 - 47 31.7</td><td>Alava - Queets</td><td rowspan="5">75 - 200*</td><td>60 - 200</td><td colspan="3">60 - 150</td><td rowspan="5">75 - 200*</td></tr>
<tr><td>47 31.7 - 46 38.17</td><td>Queets - Leadbetter</td><td>60 - 200</td><td colspan="3">60 - 150</td></tr>
<tr><td>46 38.17 - 46 16</td><td>Leadbetter - OR/WA Border</td><td colspan="2">60 - 200</td><td colspan="2">60 - 150</td></tr>
<tr><td>46 16 - 45 46</td><td>OR/WA Border - CP Falcon</td><td>75 - 200</td><td colspan="2">75 - 150</td><td>75 - 200</td></tr>
<tr><td>45 46 - 43 20.83</td><td>CP Falcon - CP Arago</td><td colspan="4">75 - 200</td></tr>
<tr><td>43 20.83 - 42 40.50</td><td>CP Arago - Humbug mt</td><td>shore - 200*</td><td colspan="4">shore - 200</td><td>shore - 200*</td></tr>
<tr><td>42 40.50 - 40 10</td><td>Humbug mt - 40 10</td><td>75 - 200*</td><td>75 - 200</td><td colspan="3">60 - 200</td><td>75 - 200*</td></tr>
</table>

Table 4 Estimated Impacts Resulting from Option 1

		North	South	Total	HG or OY
Rebuilding Species	Canary	6.1	2.8	9.0	
	POP	103.2	0.0	103.2	
	Darkbltch	220.2	32.2	252.5	
	Widow	1.9	5.8	7.7	
	Bocaccio	0.0	11.8	11.8	
	Yelloweye	0.5	0.0	0.6	
	Cowcod	0.0	0.7	0.7	
Target Species	Sablefish	2,226.2	568.1	2,794.3	2810
	Longspine	509.0	384.9	893.9	2220
	Shortspine	892.3	507.5	1,399.8	1634
	Dover	10,025.9	2,190.7	12,216.7	16500
	Arrowt'th	3,487.3	64.0	3,551.2	5800
	Petrale	2,068.3	329.1	2,397.4	2499
	Otr Flat	1,398.6	627.3	2,026.0	4884
	Slope Rk	87.6	222.9	310.5	1160N/626S

Table 5 Estimated Impacts Resulting from Option 2

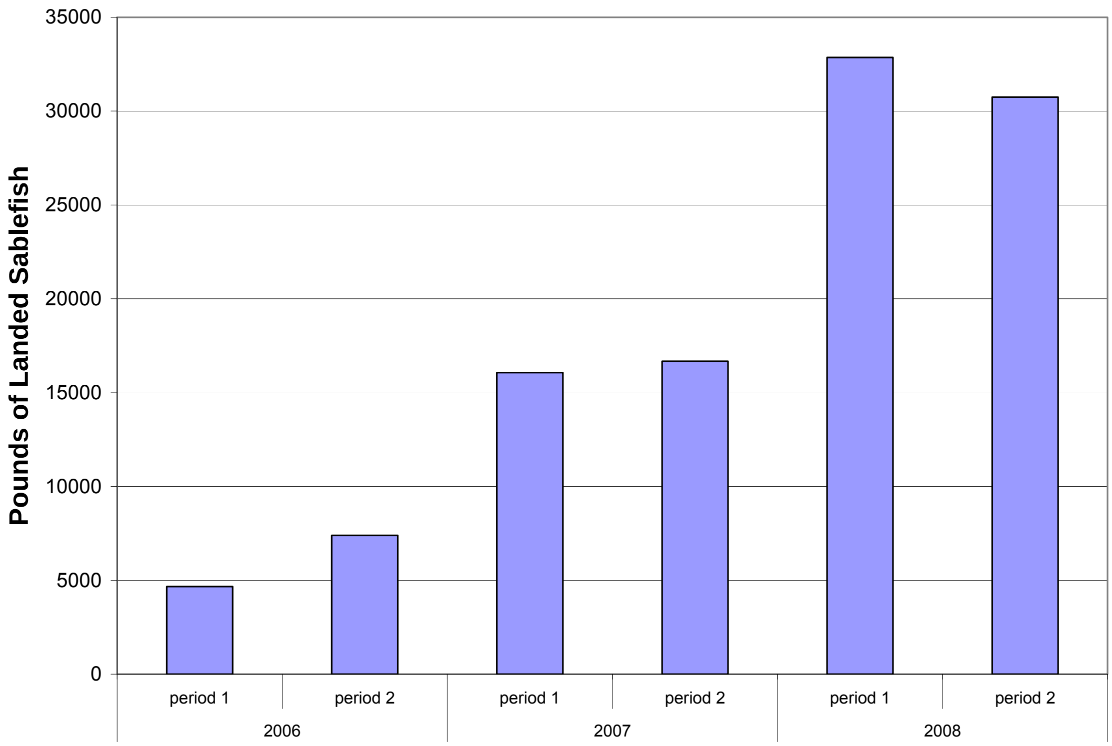
		North	South	Total	HG or OY
Rebuilding Species	Canary	6.1	2.8	9.0	
	POP	103.2	0.0	103.2	
	Darkbltch	220.2	32.2	252.5	
	Widow	1.9	5.8	7.7	
	Bocaccio	0.0	11.8	11.8	
	Yelloweye	0.5	0.0	0.6	
	Cowcod	0.0	0.7	0.7	
Target Species	Sablefish	2,226.2	568.1	2,794.3	2810
	Longspine	509.0	384.9	893.9	2220
	Shortspine	892.3	507.5	1,399.8	1634
	Dover	10,025.9	2,190.7	12,216.7	16500
	Arrowt'th	3,487.3	64.0	3,551.2	5800
	Petrale	2,081.0	331.0	2,412.0	2499
	Otr Flat	1,398.6	627.3	2,026.0	4884
	Slope Rk	87.6	222.9	310.5	1160N/626S

<u>Sablefish DTL Fishery North of 36° N. lat.</u>

The GMT received a request to examine an increase in the limited entry DTL sablefish fishery daily trip limit from 300 lbs to 500 lbs. In general, the daily limit has a large effect on effort, while the weekly and bimonthly limits affect the overall catch made by the average vessel. In the limited entry fishery, a change in the daily limit has a far lesser effect on effort shifts than in the open access fishery where history has shown that minor changes in the daily limit can lead to substantial changes in effort.

The catch of sablefish in the LE DTL fishery has come in below the allocation over the last several years. Catch limits have remained fairly constant over that time period, and therefore the GMT expects the LE DTL fishery to come in below the LE DTL allocation without an inseason adjustment. Based on this information, it appears that an increase in the LE DTL daily limit to 500 lbs could be accommodated without exceeding the LE DTL allocation. **Therefore the GMT recommends increasing the limited entry sablefish DTL daily limit to 500 lb through the rest of the year.**

<u>Sablefish Fishery South of 36° N. lat.</u>
The GMT reviewed catch data for fisheries operating in the Conception area. Available information indicates that the catch of sablefish is tracking higher than expected. The source of this unexpected catch rate appears to be the open access portion of the fishery in that area. Other fisheries in this area (limited entry fixed gear and trawl) appear to be catching sablefish at a rate near the expected catch for this time. Catch made by open access vessels is approximately double the amount caught through this time period last year, and higher yet compared to catch from 2006. This information is shown in the figure below.



If this higher than expected catch rate continues through the summer months, the GMT estimates that the sablefish OY will have been reached sometime in October. This estimate assumes the 50 mt sablefish catch limit established for the Nature Conservancy (TNC) EFP is fully attained. The implications of reaching or exceeding the sablefish OY may mean the closure of sablefish fishing opportunity as well as the closure of other target species opportunities that are caught in concert with sablefish, such as thornyheads and slope rockfish. Several factors make the October prediction uncertain including the fact that several of the open access vessels in the Conception area are planning to participate in the TNC EFP, meaning that some portion of the TNC sablefish catch limit may not be additive to estimated catch levels, but may simply represent catch that would otherwise occur by open access participants. Another factor that the GMT considered was attrition in participation due to the implementation of vessel monitoring system (VMS) requirements in this fishery on February 4, 2008. This new requirement may lower the magnitude of the effort increases that we have seen in past summers in this fishery, as it will be a much larger investment for fair weather fishers to jump into the fishery for only a few short months.

The GMT discussed potential inseason adjustments to sablefish fishing opportunities in the Conception area to achieve the Council's goal of a year round fishery. Because the higher than expected catch rate has occurred in the open access portion of that fishery, the GMT focused on that sector. Industry representatives have indicated that a reduction in the daily and weekly limit would make prosecuting that fishery infeasible. Therefore, the implementation of a monthly or bimonthly limit appears to be the most practical means of controlling catch in this fishery. Assuming the current catch rate continues, the GMT believes that a bimonthly limit of 2,100 lbs would bring catch levels down to expected levels. However, this limit could not be put in place before September. Therefore, a one month limit for August of 1,000 lbs was also assessed.

The uncertainty in catch estimates of OA sablefish in the Conception area makes the effect of the 1,000 lb August limit and 2,100 lbs bimonthly limit for period 5 and 6 somewhat uncertain; however, the GMT believes that this limit is likely to allow the Conception area fishery to run through the end of the year. In the worst case scenario, the GMT believes that directed sablefish fishing opportunity may need to be substantially restricted or eliminated at the end of the year, but opportunities on shortspine and slope rockfish are likely to be accommodated. Alternatively, in a more optimistic case, directed sablefish opportunities may continue through the end of the year.

The GMT is aware that Conception area sablefish opportunities are closely related to a possible Council decision on whether to allow TNC EFP participants the opportunity to catch 50 mt of sablefish after July, or whether to allow TNC EFP participants to catch 30 mt of sablefish after July. While the GMT does not have a specific recommendation on this issue, the GMT does note that the Council may want to hold TNC EFP participants to 30 mt and re-evaluate whether to allow those EFP participants access to the full 50 mt at the September meeting when there is more information available on the progress of Conception area sablefish catch levels. If the TNC EFP is granted 30 mt of sablefish, the GMT estimates the Conception area sablefish OY could be attained in November without inseason action.

Open Access Sablefish N of 36°

The GMT received a request from the GAP to increase the open access sablefish daily limit from 300 lb to 500 lb, but catches in this fishery are tracking right on projection, therefore the GMT does not believe an increase can be accommodated.

Nearshore Fishery North of 34° 27' N. lat.
At the March 2008 meeting the GAP requested that the GMT assess the effects of restricting the nearshore fishery and reducing canary impacts. The Council subsequently requested the GMT analyze management measure alternatives that would restrict the nearshore fixed gear commercial fishery to 1.7 mt of canary rockfish. The projected impacts for all species were updated in March and canary rockfish projected impacts in the nearshore fishery increased to 2.6 mt as a result of the latest bycatch rates. The 2.6 mt is accounted for in the current updated and balanced scorecard attached to the end of this statement. The GMT submitted a request to the West Coast Groundfish Observer Program for data to inform more refined RCA adjustments that could be designed to reduce canary impacts. Just prior to the April meeting, the GMT received a summary of canary and yelloweye rockfish bycatch in the commercial nearshore fishery from the observer program, but did not have sufficient time to complete an analysis of the data to inform potential management measures at that time.

Following the April Council meeting the GMT evaluated this data and found that approximately 91% of the canary impacts in the nearshore fishery occur between Point Arena (38°57 N lat.) and Point San Pedro (37°35 N lat.) and 40°10' N lat. to 43° N lat. The only tool available to reduce impacts in these areas is changing the RCA.

The GMT understands that the GAP is no longer requesting that the nearshore fishery be restricted. Furthermore, under status quo management measures, the scorecard is balanced. Nevertheless, the GMT evaluated several options for restricting the commercial nearshore groundfish fishery.

- One option is to restrict the RCA to the shore between Point Arena (38°57' N. lat.) to Point San Pedro (37°35' N. lat.). 20.3 percent of the canary impacts occur in this area.
- A second option is to restrict the RCA to the shore between 40°10' N. lat. to 43° N lat. 70.7 percent of the canary impacts occur in this area.
- A third option is to restrict the fishery north and south of 40°10' N. lat. (but north of 34°27' N lat) to 20 fathoms and reduce landed catch amounts by 30 percent. This would bring canary impacts down to 1.7 metric tons.

Because of the manner in which California state regulations are specified for the commercial nearshore fishery, fishermen in areas completely closed would not be able to move. Therefore, in addition to adverse impacts occurring in ports adjacent to closed areas, fishermen in those areas would not be able to move and would find their fishing opportunities eliminated.

Because of the above factors, and because the GMT understands that industry is no longer requesting these restrictions on the nearshore fishery, the GMT does not recommend any adjustments to the commercial nearshore fishery.

Accounting For Ice and Slime

The West Coast groundfish regulations state that, "All weights are in round weight or round-weight equivalents, unless specified otherwise;" and, that the "[r]ound weight does not include ice, water, or slime." 50 CFR §§ 660.301 and 660.302.

It came to the GMT's attention that there are inconsistent methods on the coast used to account for water, ice, and slime in the reporting of round weights. Some processors might use water baths or de-icers before weighing the fish, whereas others do not and instead take a percentage deduction off the weights reported on the fish ticket.

The team briefly discussed the issue and agreed that consistency is important for proper catch accounting and enforcement of trip and other catch limits, as well as for business fairness for harvesters and processors. The team also received some input from the GAP and Enforcement Consultants and there was agreement that it was an important issue that would benefit from further attention. However, the team's full agenda did not allow time for adequate discussion and no ready solution was apparent. The GMT thus recommends that the Council request that a working group further explore the needs of management, enforcement, and industry and determine a consistent method for reporting of round weights.

<u>GMT Recommendations</u>

1) Adopt Option 1 or 2 for the LE multi species trawl fishery.
2) Implement a 1,000 lb per month limit in the OA sablefish fishery, south of 36° for August.
3) Implement a 2,100 lb per 2 month limit in the OA sablefish fishery south of 36° for periods 5 and 6.
4) Increase the daily limit in the LE DTL fishery north of 36° to 500 lb.
5) Ice and Slime – request that a working group further explore the needs of management, enforcement, and industry and determine a consistent method for reporting of round weights.

PFMC
6/10/2008

2008 Projected mortality impacts (mt) of overfished groundfish species updated at the June Council meeting with GMT recommended inseason adjustments

06/10/08

Fishery	Bocaccio b/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	11.8	9.0	0.7	252.5	103.2	7.7	0.6
Limited Entry Trawl- Whiting							
At-sea whiting motherships a/					1.9		0.0
At-sea whiting cat-proc a/		4.7		40.0		275.0	0.0
Shoreside whiting a/					0.0		0.0
Tribal whiting		0.7		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		0.8					1.8
Sablefish	13.4		0.0	0.6	0.3	0.9	
Non-Sablefish			0.1	0.4		0.5	
Open Access: Directed Groundfish							
Sablefish DTL	0.0	0.2		0.2	0.1	0.0	0.3
Nearshore (North of 40°10' N. lat.)	0.0	2.6	0.1	0.0	0.0	0.5	1.6
Nearshore (South of 40°10' N. lat.)	0.1			0.0	0.0		
Other	10.6	1.0		0.0	0.0	0.0	0.1
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.0		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
CPS- wetfish c/	0.3						
CPS- squid d/							
Dungeness crab c/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut c/	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	0.8	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 e/							
WA		5.7					6.2
OR						1.4	
CA	47.2	9.0	0.1			6.5	2.1
EFPs	11.0	0.1	0.2	1.0		3.4	0.1
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs. f/							
	2.0	5.5	0.2	2.0	2.0	1.1	3.0
TOTAL	97.4	43.6	1.4	296.8	111.8	343.5	18.5
2008 OY	218	44.0	4.0	330	150	368	20
Difference	120.6	0.4	2.6	33.3	38.2	24.5	1.5
Percent of OY	44.7%	99.0%	36.0%	89.9%	74.6%	93.3%	92.3%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data					

a/ Non-tribal whiting numbers reflect bycatch limits for the non-tribal whiting sectors.

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).

e/ Values in scorecard represent projected impacts for WA and OR. However, harvest guidelines for 2008 are as follows: canary in WA and OR combined = 8.2 mt; yelloweye in WA and OR combined = 6.8 mt. For California, harvest guidelines are represented.

f/ Research projections updated November 2007. Canary and YE impacts updated June 2008.

GROUNDFISH ADVISORY SUBPANEL REPORT ON CONSIDERATION OF INSEASON ADJUSTMENTS

1. Daily trip limit (DTL) Sablefish in Conception area:
   The Groundfish Advisory Subpanel (GAP) agrees with the Groundfish Management Team (GMT) recommendation to implement a 2,100 lb cumulative limit for the last two periods in 2008 and a 1,000 lb limit for the month of August.

2. Trawl proposal:
   The GAP supports Option 2.

3. Limited Entry Fixed Gear DTL Sablefish North of 36:
   The GAP supports an increase in the daily limit from 300 to 500 pounds.

PFMC
6/10/08

Agenda Item F.5.e
Public Comment
June 2008

JEFF MILES F/V TOP GUN

RECEIVED
MAY 2 0 2008
PFMC

May 16, 2008

To John Devore and Council Members,

There is no need to make any in-season adjustments in the near shore fishery. The projected '08 canary impacts of 44 metrics match the '08 canary OY. With the canary projection way up in all sectors, it is hard to understand why any new restrictions are needed. With the canary's being 42 years ahead of schedule and a catch of 105 metric tons of catch for the next year, there is no reason to make any in-season adjustments. There will be severe economic impact on us with no salmon. It will be very hard to make a living. No gear restrictions. This will also cause severe economic impacts. Please NO gear restrictions.

With the yellow eye restrictions that will come up, more restrictions are not needed. The RCA is the principal habitat for the yellow eye and the canary. We can't help the fact that the "spill over" from the RCA is spreading out. The RCA is doing what it was designed to do. To move the RCA in or out or make any gear restrictions would be very bad. We are getting more by-catch because there is a lot more of them. Has it occurred to any one that more by-catch in the same area means there are more of them? The yellow eye restrictions would or could bankrupt some people. No gear restrictions or don't move the RCA lines. There is no need.

Thanks,

Jeffrey Miles

F/V Top Gun

RECEIVED
MAY 2 0 2008
PFMC

~~To whom i~~

Sirs

Just wondering why any adjustments are needed in 2008 nearshore fisheries. Canary stocks are up and way ahead of schedule.

With no salmon season any more restrictions would place severe hardships on nearshore fisheman.

Thank you
Lyle A. Kuhn

AMENDMENT 20: TRAWL RATIONALIZATION ALTERNATIVES

The Council has considered groundfish trawl fishery rationalization at 15 Council meetings over the last four and a half years. At its November 2007 meeting, the Council refined the set of trawl rationalization alternatives for intensified analysis, with the exception of certain sections on program administration related to tracking, monitoring, costs and fees. The Council addressed tracking and monitoring at its March 2008 meeting and will receive some estimates of administrative costs at this meeting. At this meeting, the Council is being asked to adopted final alternatives for analysis in a preliminary draft environmental impact statement (DEIS) and a set of preliminary preferred alternatives. Based on the preferred alternatives, the preliminary DEIS will be finalized over the summer and released for public review in late September. The Council is scheduled to take final action at its November 2008 meeting. In January 2009, the Council is required to provide to Congress "a proposal for the appropriate rationalization program for the Pacific trawl groundfish and whiting fisheries," including "fully analyze[d] alternative program designs." (Section 302(f), Magnuson-Stevens Act [MSA]). The Council is scheduled to provide a finalized DEIS to NMFS in 2009 for final approval under the MSA.

In preparation for this Council meeting, the Groundfish Allocation Committee (GAC) and Trawl Individual Quota Committee (TIQC) met to develop recommendations on a preliminary preferred alternative. The GAC met May 13-15 and developed the set of recommendations contained in Agenda Item F.6.c, GAC Report. The TIQC attended the GAC meeting to hear the development of those recommendations and then met May 15-16 to develop their recommendations (Agenda Item F.6.d, TIQC Report).

This agenda item will begin with an overview of the decision points (Agenda Item F.6.a, Attachment 1) and trawl rationalization alternatives (Agenda Item F.6.a, Alternatives). Following that, an orientation on the analysis will be provided (Agenda Item F.6.b, Analysis—Chapters 4 & 10, and Agenda Item F.6.b, Analysis—Appendices); a brief summary of analytical results, including materials developed in response to GAC requests (Agenda Item F.6.b, Supplemental Analysis); and a presentation on tracking monitoring and costs (Agenda Item F.6.b, Supplemental Tracking, Monitoring, and Costs). The presentation used to summarize analytical results for the GAC is provided as Agenda Item F.6.b, GAC Meeting Presentation, with the augmentation of cross references to sections of the analysis. We do not anticipate reviewing these slides as part of the presentation to the Council.

The start of the overview of the decision points (Agenda Item F.6.a, Attachment 1) provides a hierarchy for addressing the major decisions needed to develop a preliminary preferred alternative. This order reflects that followed by the GAC at its meeting. The Council may find it beneficial to organize its discussion and action in the same order or to entertain a motion with a slate of preferred options and work through the motion with amendments.

Council Action:

Specify alternatives and preferred options for analysis in the preliminary DEIS.

Reference Materials:

1. Agenda Item F.6.a, Attachment 1: Trawl Rationalization Decision Points.
2. Agenda Item F.6.a, Alternatives: Goals, Objectives, and Alternatives, Excerpts from Chapters 1, 2, and 6 of the EIS.
3. Agenda Item F.6.b, Analysis - Chapters 4 & 10: Excerpts from the Analysis, Chapters 4 and 10.
4. Agenda Item F.6.b, Analysis - Appendices: Excerpts from the Analysis, Appendices A (excerpts), B, and C.
5. Agenda Item F.6.b, ***Supplemental*** Analysis.
6. Agenda Item F.6.b: ***Supplemental*** Tracking, Monitoring, and Costs.
7. Agenda Item F.6.b, GAC Meeting Presentation.
8. Agenda Item F.6.c, GAC Report: Groundfish Allocation Committee Report on Amendment 20: Trawl Rationalization Alternatives.
9. Agenda Item F.6.d, TIQC Report: Trawl Individual Quota Committee Report on Amendment 20: Trawl Rationalization Alternatives.
10. Agenda Item F.6.e, Public Comment.

Agenda Order:

a.	Agenda Item Overview	Jim Seger
b.	Overview of the Analysis	Analytical Staff
c.	Recommendations of the Groundfish Allocation Committee	Don Hansen
d.	Reports and Comments of Advisory Bodies	
e.	Public Comment	
f.	**Council Action:** Adopt Alternatives for Analysis in a Preliminary Draft Environmental Impact Statement and a Preferred Alternative for Public Review	

PFMC
05/27/08

GOALS, OBJECTIVES, ALTERNATIVES

EXCERPTS FROM CHAPTERS 1, 2 AND 6

OF

RATIONALIZATION OF THE PACIFIC COAST GROUNDFISH LIMITED ENTRY TRAWL FISHERY

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
PORTLAND, OR 97220
503-820-2280
WWW.PCOUNCIL.ORG

AND THE

NATIONAL MARINE FISHERIES SERVICE
7600 SAND POINT WAY NE, BIN C15700
SEATTLE, WA 98115-0070
206-526-6150

JUNE 2008

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LIST OF TABLES

CHAPTER 1 INTRODUCTION

1.1 How This Document is Organized

This document provides information and an evaluation of a proposed action to change Federal management of the Pacific Coast groundfish trawl fishery, which is managed under the *Pacific Coast Groundfish Fishery Management Plan* (groundfish FMP), developed by the Pacific Fishery Management Council (Council). This action, is intended, among other things, to increase economic efficiency within the fishery (termed "rationalization") and reduce bycatch (fish that are not kept or sold and are discarded, usually at sea). Implementing the action will involve both changes to the management framework in the FMP and promulgation of implementing regulations. The National Marine Fisheries Service (NMFS) reviews the new management proposals developed by the Council; if the proposal is approved, the FMP is amended to reflect the changes and NMFS implements any necessary regulations. 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.

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 (Section 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 proposed action referenced above could possibly 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, MSA, the Regulatory Flexibility Act (RFA), and Executive Order (EO) 12866. For 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 (National Oceanic and Atmospheric Administration (NOAA) Administrative Order 216-6, Section 5.01.b.1(i)) stipulate a minimum 45-day public comment period on the DEIS.[1] 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 waiting 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.[2] 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. In this EIS, Chapters 1 and 2 cover the purpose and need for the action and describe the alternatives. Chapter 3 describes the components of the biological, physical, and human environments potentially affected by the proposed action. Chapter 4 evaluates the direct, indirect and cumulative effects of the alternatives on the resources and stakeholder groups of concern. The analysis is organized around "environmental components" whereby sections in the chapter examine and describes the direct, indirect and cumulative effects of each alternative on a particular resource or stakeholder group. The alternatives include the no action (status quo) alternative and the preferred alternative (when identified by the Council). These chapters describe both the status quo environment potentially affected by the proposed action and the predicted impacts of each of the alternatives. Subsequent chapters (and appendices) cover the following topics:

- 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 trawl rationalization program goals, objectives, and constraints and guiding principles (listed in Section 1.2.3); 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 a detailed analysis of the components, elements, and options that are part of the IFQ alternative, one of the action alternatives described in Chapter 2.
- Appendix B contains a detailed analysis of the components, elements, and options that are part of the co-op alternative, one of the action alternatives described in Chapter 2.

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1 This required public comment period will occur after the Council has taken final action, as part of NMFS's review process. Preliminary drafts of the document will also be made available for public review as part of the Council process: this partial draft document in advance of the June 2008 Council meeting and a substantially complete draft in advance of the November 2008 Council meeting.

2 Federal regulations at 40 CFR 1502 detail the requirements for an EIS. Although there are several additional components, this list is of the core elements.

- Appendix C contains descriptions of the models used in the impact analysis.
- Appendix D is the RIR and IRFA [To be completed].

1.2 Proposed Action and Purpose and Need

1.2.1 The Proposed Action

The proposed action is to replace the current, primary management tool used for control of the West coast groundfish trawl catch—a system of two-month cumulative landing limits for most species and season closures for whiting—with a system requiring more individual accountability by the assignment of limited access privileges. (Limited access privileges are a form of output control whereby an individual fisherman, community, or other entity is granted the privilege to catch a specified portion of the total allowable catch.) The alternatives include (1) a catch-based individual fishing quota (IFQ) system under which each IFQ pound could be caught at any time during an open season, which could be applied to the whole groundfish fishery or selected sectors of the fishery; and (2) an enforced system of cooperatives (co-ops) that would be applied to one or more of the fishery sectors that target Pacific whiting. The status quo alternative (no action) could also be considered for application to one or more fishery sectors even if one or both action alternatives (IFQs or co-ops) are chosen for the other sectors.

Federally-managed Pacific groundfish fisheries occurring off the coasts of Washington, Oregon, and California establish the geographic context for the proposed action (see Figure 1–1).

1.2.2 Need for Action (Problems for Resolution)

Despite a program to buy back groundfish limited entry permits and associated vessels, completed in 2003, 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 {US Commission on Ocean Policy, 2004 1444 /id /d}. 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 (discarded incidental catch), 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 in general developing management schemes for minimizing bycatch and specific management of overfished species incidental catch. Through the groundfish Strategic Plan and Amendment 18 to the groundfish FMP, the Council has indicated its support for future use of IFQ programs to manage commercial groundfish fisheries.[3] These programs will give individual fishery participants more flexibility in how they participate in the fishery, and more accountability for how individual actions affecting incidental catch of overfished species impact the groundfish fishery as a whole.

[3] Section 6.3.3 of the FMP, as amended, authorizes the Council to establish IFQ programs for any groundfish commercial fishery sector for the purposes of reducing fishing capacity, minimizing bycatch, and to meet other goals of the FMP.

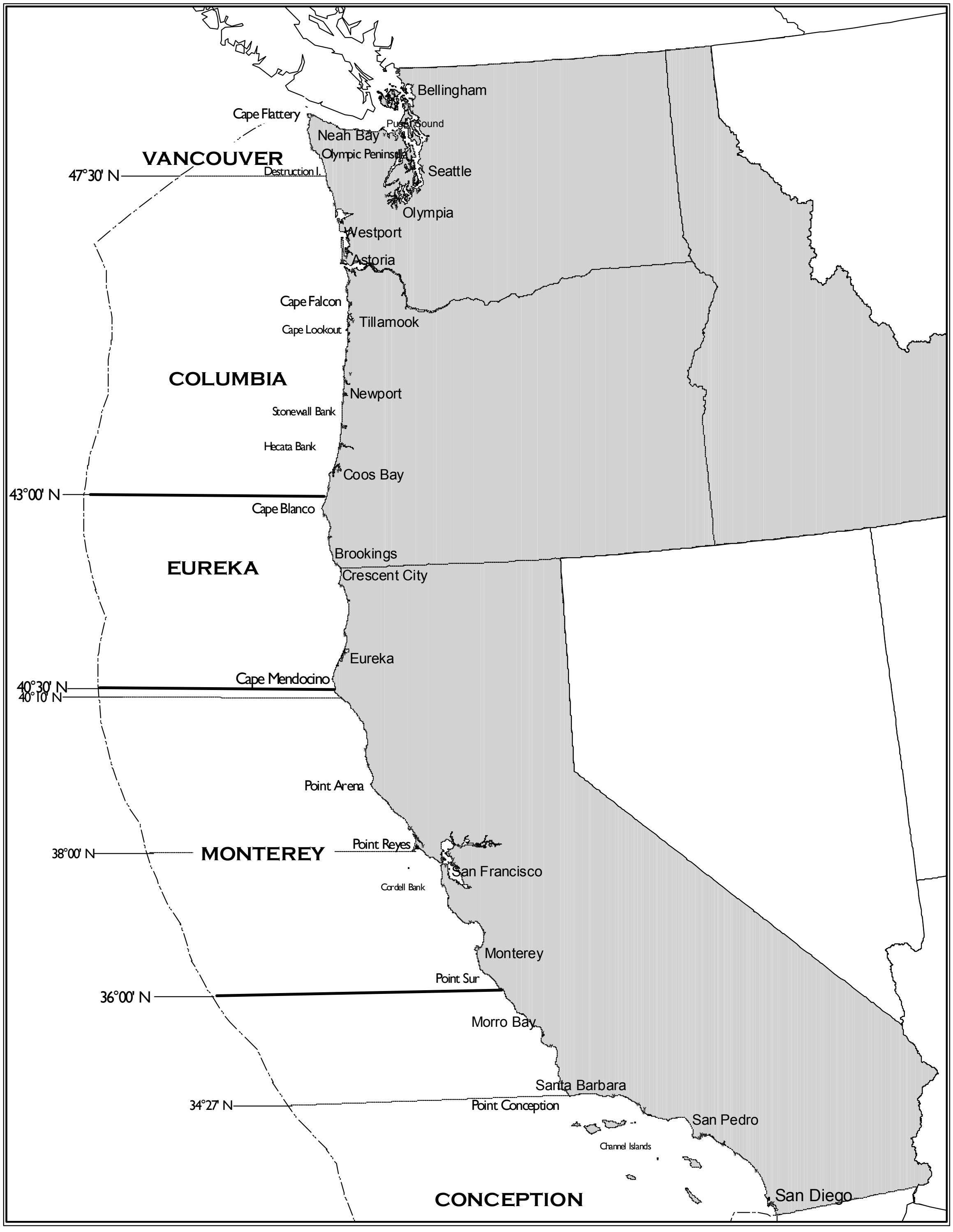

Figure 1–1. The action area, west coast groundfish management areas, and other key management lines.

The Council sent the following problem statement out for public review during the public scoping period:

> 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 project bycatch of overfished species. These discard rates determine the degree to which managers must constrain the harvest of target 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, increasing management efficiency, and responding to community interest. "Taking advantage of the available allowable harvests" includes conducting safe and efficient harvest activities in a manner that optimizes net benefits over both the short and long term.

1.2.3 Purpose of the Proposed Action

In 2003 the Council established a Trawl Individual Quota Committee (TIQC), which was charged with the task of assisting the Council in identifying the elements of a trawl individual quota program and scoping alternatives and potential impacts of those alternatives in support of the requirements of the MSA and NEPA.[4] At its first meeting in October 2003, the TIQC drafted a set of goals and objectives.

[4] The term "individual quota program" was defined broadly to include any dedicated access privilege program, as described in the Notice of Intent to Prepare an EIS published in the Federal Register (69 FR 29482, May 24, 2004), which described the scoping process. Thus the TIQC's charge also included considering community development quota and individual processing quotas.

Another Council-established committee, the Independent Experts Panel (IEP), and the TIQC subsequently recommended modifying some of the goals and objectives. The Council adopted this list in June 2005, but at their March 2007 meeting the Council adopted a further revision of the goals and objectives. (The participation of the TIQC, the IEP, and other entities in the scoping process is described below in Section 1.7.) To pursue the goal thus developed, and shown below, the Council is considering alternatives that would rationalize the west coast trawl fishery and provide incentives to reduce bycatch, either through an IFQ program for all groundfish limited entry trawl sectors and/or through cooperatives for the fishery sectors targeting Pacific whiting. Under either alternative, allocations would be made to eligible fishery participants as a privilege to harvest a portion of fish, and not as a property right. Though structurally different, the Council's intention is that both the IFQ and co-op alternatives fulfill the goal of the program.

The following goal and lists of objectives and constraints and guiding principles outline the purpose of the proposed action.

Goal

> *Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch* [5]

Objectives

The above goal is supported by the following objectives:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
3. Promote practices that reduce bycatch and discard mortality and minimize ecological impacts.
4. Increase operational flexibility.
5. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
7. Provide quality product for the consumer.
8. Increase safety in the fishery.

Constraints and Guiding Principles

The above goals and objectives should be achieved while:

1. Taking into account the biological structure of the stocks including, but not limited to, populations and genetics.
2. Taking into account the need to ensure that the total OYs and Allowable Biological Catch (ABC) are not exceeded.
3. Minimizing negative impacts resulting from localized concentrations of fishing effort.
4. Accounting for total groundfish mortality.

[5] "Bycatch" is defined in the Magnuson-Stevens Act as: "species of 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."

5. Avoiding provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.
6. Avoiding excessive quota concentration.
7. Providing efficient and effective monitoring and enforcement.
8. Designing a responsive mechanism for program review, evaluation, and modification.
9. Taking into account the management and administrative costs of implementing and overseeing the IFQ or co-op program and complementary catch monitoring programs, and the limited state and federal resources available.

As originally framed, this action focused on the more general concept of dedicated access privileges, now more commonly referred to as limited access privileges (described in Section 1.3). However, as the Council developed the range of alternatives, other methods to achieve the goals and objectives listed above were considered. The current range of alternatives includes establishing a framework for mandatory fishing vessel cooperatives, which would not operate as an IFQ system. Because of these changes, beginning in 2006, the developing program has been referred to with the more general term “trawl rationalization” in order to capture the social and economic objectives that are expected to also have substantial conservation benefits, for example by reducing bycatch.

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 other sections in the Chapter 6 discuss of consistency with the groundfish FMP and MSA national standards; and in Appendix D where impacts on net national benefits, small entities and communities are addressed.

1.3 Background on Limited Access Privileges

1.3.1 The Theory behind Tradable Permits

Tradable permit arrangements have found wide application in dealing with common pool resources. Unlike private property, rights of access to and use of common pool resources are not unitary—controlled by a single person or entity. They are a kind of public good with particular characteristics; aside from the lack of unitary authority to control access and use they are subtractable—that is, the use of the resource by one person affects the ability of others to use it. Examples of common pool resources include the atmosphere (as a place to dispose of airborne pollutants traded off against its life sustaining properties), water resources (again, both as a sink for pollutants and a resource for human use) and—relevant to the case at hand—fish. Common pool resources may be “open access” with no institutional arrangements to constrain access or use, government owned, or “common property” under which access is limited and some type of institution facilitates decision making about resource use by the group that has exclusive access.

U.S. fisheries have traditionally fallen under the government ownership, or more accurately trusteeship, institutional model. Under the trust doctrine the government sets rules about resource use for the benefit of its citizens who are the “owners” of the resource. Access may be unlimited (or practically so, if only limited to any citizen or resident) and government may establish rules over use in an effort to prevent over-exploitation. A variety of rules may be established to limit fishing activity, or effort—and thus indirectly, catch, such as time and area closures and limits on gear effectiveness. Alternatively, catch can be limited directly through quotas, bag limits, and landing limits (trip limits), and the like.

Limiting catch directly or indirectly may address stock conservation concerns if catches can be constrained to or below maximum sustainable yield (MSY); even so, economic efficiency objectives are unlikely to be met. Furthermore, effectively matching catch with MSY can be very expensive in terms of government monitoring and enforcement costs. If participation cannot be limited, according to early fisheries economics theory {Gordon, 1954 1447 /id;Shaefer, 1957 1448 /id}, people will enter the fishery until an equilibrium is reached where costs (including the opportunity cost of capital and labor[6]) match revenue. Even in a fishery with a few vessels this phenomenon is expected: new vessels will continue to enter the fishery, even though average cost for each vessel increases, to the point where revenues no longer exceed costs. In an unconstrained fishery, and depending on costs, this usually occurs at a level of catch above MSY. Maximum economic yield, according to this model, occurs below MSY when revenue is highest in relation to costs. Fishery participants probably would like to maximize profit (the difference between costs and revenue), but they cannot do so if there is no means to exclude entry. Thus, while the individual may be satisfied with wages received, for the fishery as whole there is a cost in terms of lost profits.

Even if participation can be limited, profits may be dissipated as costs escalate, because of over-investment in vessels and equipment to beat out other fishers in catching the available fish. (This type of competition should not be confused with market competition, which serves to lower prices. In an unconstrained fishery fewer fish will be caught at higher costs, resulting in higher prices in the raw fish market. And even in a constrained fishery over-capitalization results in higher costs than would otherwise be necessary, potentially increasing prices).

Tradable permits ration access to a resource—the permit represents an exclusive right to use some increment of the resource (a ton of sulfur dioxide emitted into the air or a pound of fish brought aboard for example) {Tietenberg, 2002 1449 /id}. In such a scheme the first step is to set a limit on total resource use, total allowable catch, which in the west coast groundfish context, is the OY. This aggregate amount can then be subdivided and allocated in some fashion. In an IFQ scheme this allocation typically represents a percentage share of the total allowable catch, which can vary over time (OYs, for example, are set every two years based on an assessment of stock status and can go up or down). This share can then be converted into a quantity (pounds of fish say) when applied against the externally-determined total allowable catch limit (or OY).

Tradability is an important feature in terms of economic efficiency and bycatch reduction objectives. It requires each fisher to match the amount of fish caught to the permit amount (shares converted into "quota pounds"). In a competitive market for shares they will tend to accrue to the highest valued use. Someone with higher operational costs, for example, may be better off selling their shares to a person who can use them at lower overall cost (operational cost plus the cost of share purchase). The seller is better off by getting more from selling the shares than he or she could realize from using them and the buyer is better off because they still earn profit after absorbing the purchase cost.[7] In this construct, the shares have been put to the most efficient use and society as a whole is better off because both the buyer and seller are. (However, some social costs may be external to the tradable quota system. For example, consolidation of shares in fewer hands, resulting in a smaller fishing fleet, can affect fishing-dependent communities where the lost vessels were important income generators, contributed to community identity, supported infrastructure used by other fleets, or provided other benefits.) For a tradable permit system to be effective several preconditions must be met {Tietenberg, 2002 1449 /id}. A competitive market may be distorted if any one participant exercises too much market power. Transactions costs—

6 In this context opportunity cost represents the individual's assessment that no other activity that he or she can pursue will pay a comparable wage. Opportunity cost can include non-monetary benefits. For example, someone may choose to continue fishing at a lower wage because the work is more enjoyable than other kinds of work that might pay better.

7 Because of the distinction between quota shares and the quota pounds that represent a realized amount, a variety of other arrangements can be used, such as leasing or selling quota pounds (while retaining the asset value of the quota share). But the general principal still applies.

the costs involved in exchanging permits (above the actual sales price) and in obtaining information about prices—cannot be too high. The system as a whole relies on effective monitoring and enforcement; “free riding” or “quota busting” occurs if a participant catches fish without possessing the corresponding quota pounds. Resource conservation objectives are not met (which affects resource value, reflected in share prices) and over time confidence in the system may break down.

The initial allocation of quota shares is often controversial. According to economic theory the value of the resource will be maximized no matter how the shares are initially allocated {Montgomery, 1972 1451 /id}, whether freely distributed (based on past participation or by lottery) or auctioned off. The implication, according to Tietenberg {Tietenberg, 2002 1449 /id /d /ft ", p. 200"} is that “the resource manager can use initial allocation to solve other goals (such as political feasibility or ethical concerns) without sacrificing cost-effectiveness.”

By itself an IFQ program may have few direct conservation benefits, but substantial indirect benefits. In the groundfish fishery regulatory bycatch (discarding of fish because regulations discouraging targeting require one to do so) has been a big problem in terms of lost value and, if not adequately accounted for, contributes to excess mortality and mis-specification of future OYs. The IFQ program will require 100 percent observer coverage; the program may also increase efficiency and profits enough for industry to be able to bear these monitoring costs. Additionally, a program requiring IFQs to cover catch rather than landings is expected to motivate fishers to avoid stocks with low OYs (such as overfished species), because scarcity value would drive up share prices for these stocks. At the same time, direct conservation benefits are probably limited. For example, optimum yield (MSY as reduced by other biological and social factors) is set externally. If it is mis-specified, the IFQ program does nothing to correct the problem. Certain external costs—habitat impacts, for example—may be addressed through the use of IFQ allocations to provide incentive for use of low impact gears (as an example, see the adaptive management provisions described in Chapter 2). It could also be argued that an IFQ program, because share value is tied to yield, would stimulate a conservation ethic among fishers, prompting them to minimize such external effects. For this to work, fishers would have to see a clear correlation between their behavior and the effect on yield and be confident that all, or most, of the other fishers behave in the same fashion. This potential benefit is discussed in the analysis.

An IFQ program may also reduce some government costs—there may be less need to constantly adjust regulations constraining the pace of fishing, for example—while increasing other administrative and monitoring costs (tracking the exchange of quota, observing total catch requiring onboard observers).

1.3.2 Cooperatives

Cooperatives differ from by IFQs in that catch privileges are held jointly by members of the co-op. They can probably be classed as a kind of common property regime, albeit in this case one where government would play an instrumental role. Instead of quota shares held by individuals, each co-op member receives an allocation that can only be accessed exclusively when it is pooled within the co-op. How fishing occurs within the cooperative (how much of the co-op’s pooled allocation assigned to the co-op any one member may catch) is matter of joint decision making by co-op members (through side deals, contracts, and the like). In effect, tradability can occur within a co-op and such arrangements are not brokered by government, rather they are purely a matter of private arrangements.

In theory cooperatives are less economically efficient than IFQs because the barriers imposed on tradability prevent the assignment of catch privileges to the highest valued use. On the other hand, cooperatives may facilitate fishers’ ability to pool both opportunity and risk. This is an important benefit in west coast groundfish fisheries where low OYs for some overfished species are likely to impose constraints on target species fishing opportunity. Government-facilitated cooperatives are probably more attractive in the Pacific whiting fishery because the catch and operational characteristics are more uniform in comparison to the non-whiting sector. In addition, the whiting fishery does not operate under cumulative landings limits so more efficiency may be lost in a race for fish. This means that cooperatives offer efficiency gains from status quo in comparison to—other things being equal—adoption of cooperatives in the non-whiting trawl fishery.

1.3.3 Dedicated Access Privileges and Concerns about Conferring a Property Right

The U.S. Commission on Ocean Policy in its 2004 report {US Commission on Ocean Policy, 2004 1444 /id} popularized the term "dedicated access privilege" without defining it except by example. The term is meant, first, to underscore the diversity of arrangements that can be established to regulate access to fishery resources including IFQs, cooperatives, or community control. As important, the Commission was at pains to underscore that these arrangements do not confer any real interest in property, as represented by ownership of a quota share, for example:

> U.S. fishermen do not now and will never have inalienable rights to fish because the fisheries resources of the United States belong to all people of the United States. Under current law, fishermen are granted a privilege to fish, subject to certain conditions. Because this privilege can be taken away, it is not a right. (p. 289)

Section 303A of the reauthorized MSA, entitled "Limited Access Privilege Programs," elaborates this characterization by stating that such programs do not create a right, title, or interest in allocated fishing opportunity (e.g., quota shares). Any such privilege may be revoked without compensation at any time.

1.4 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 U.S. west coast. These include the following species groups:

- **Rockfish**. The FMP covers at least[8] 64 different species of rockfish, including widow, yellowtail, canary, shortbelly, chilipepper, yelloweye, darkblotched, and vermilion rockfish; bocaccio; cowcod; thornyheads; 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

8 Because the management unit includes all species in the family Scorpaenidae, and their systematics is still being resolved, there is a potential for new species to be added to the management unit.

CHAPTER 2 DESCRIPTION OF THE ALTERNATIVES

2.1 Introduction

This chapter describes the alternatives for implementing a trawl rationalization program. There are three basic alternatives:

Status Quo Management Regime: If this alternative is chosen, status quo will continue, including vessel cumulative landing limits for nonwhiting and season management for whiting.

Individual Fishing Quota (IFQ) Alternative: If this alternative is chosen, IFQs will be used to manage the catch of groundfish caught by trawl vessels operating under a limited entry (LE) trawl permit with the following exceptions. IFQs will not be required for catch by an LE trawl vessel operating in fisheries (such as shrimp) in which groundfish is harvested incidentally, nor for catch by an LE trawl vessel when operating as part of LE fixed gear fishery (for vessels with LE permit(s) endorsed for both trawl and fixed gears).

Whiting Sector Cooperative Alternative: If this alternative is chosen, co-ops will be established for one or more of the three whiting sectors. Options are provided for the possible rollover of excess whiting from one sector to another and the possible allocation and rollover of bycatch species among sectors. The co-op structure for each of the whiting sectors is as follows:

- Mothership sector co-ops: Catcher vessel permit co-ops and limited entry for motherships.
- Shoreside sector co-ops: Catcher vessel permit co-ops and two year constraint on processor participation.
- Catcher-processor sector co-ops: Continued voluntary co-ops for the catcher-processor sector and endorsement to close the class of catcher-processor permits.

Implementing trawl rationalization—whether through IFQ or cooperatives—requires the specification of numerous program features. In many cases there are alternative ways of specifying these features, which are structured as options (choices to be made in structuring the program) where applicable. The next section describes the action alternatives in summary form. Then Sections 2.3 through 2.5 describe the status quo, IFQ, and whiting sector cooperative alternatives in greater detail. For the two action alternatives, each program element and any options for how they may be implemented are specified. Appendices A and B provide still more detailed description and evaluation of the elements of an IFQ and whiting cooperative program, respectively. Table 2-3, which starts on page 45, presents the IFQ program features and options at the greatest level of detail.

2.2 Overview of the Alternatives

Two key characteristics of the program, individual catch accountability and flexible vessel limits, are expected to achieve most elements of the program goal (see Chapter 1). In comparison, under status quo management, vessels are individually accountable only for landings (not discards), and fishing is restricted by cumulative trip limits or season closures that are the same for all vessels.

The co-op alternative includes a separate co-op program for each whiting sector. Table 2-1 provides an overview of major elements differentiating the IFQ alternative from the co-op alternative and, within the co-op alternative, differentiating the sector-specific co-op programs from one another.

Neither the IFQ alternative nor the co-op alternative will change the allocation between trawl and other sectors, nor the allocation among trawl sectors. Allocation among sectors is needed to implement the IFQ program but is being handled in a separate process outside of this EIS (see Section 1.6.5). The IFQ alternative provides freely transferable and highly divisible IFQ, which a vessel would need to acquire to cover its catch. NMFS would track the transfers of IFQ and check it against vessel catch. Processors may be given an initial allocation of IFQ or an adaptive management provision may provide processor compensation.

Under the catcher vessel co-op programs (both the mothership and shoreside programs), catcher vessels with permits that meet minimum qualifying requirements would receive a whiting endorsement. The whiting endorsements would be specific for each whiting sector. An option is provided under which the whiting endorsements could be permanently transferred from one limited entry trawl permit to another, through NMFS. Another option would prohibit such transfers. When the endorsements are first issued, the permit's history would be used to associate an amount of whiting catch history with each endorsement. The endorsement catch history might be thought of as a permit or endorsement share. However, the endorsement shares are not divisible and the permit holder's exclusive access to the share is limited. Each year the permit holder would choose between participating in a harvester co-op or in the non-co-op fishery. NMFS would allocate to the co-op or the non-co-op fishery based on the catch history associated with each endorsement. Each co-op would be responsible for managing the fishing of its members through private agreements. It is only through these private agreements that the shares a vessel brings to the co-op could be transferred to a different vessel. The vessels participating in the non-co-op fishery do not have individual exclusive claims to the allocation they contribute to the non-co-op fishery, and therefore no opportunity to transfer permit shares from one vessel to another. NMFS monitors catch at aggregate levels, closing individual co-ops, the non-co-op fishery, and the sector as needed to keep catch within the allocation. If inter-co-op agreements are formed, NMFS may only need to track catch at the inter-co-op level, rather than the level of the individual co-op. If such inter-co-ops cover an entire whiting sector, then NMFS would track catch at the sector level.

The **mothership co-op program** provides a limited entry system for mothership processors. Catcher vessel permits opting to participate in a co-op have all or a portion of their catch tied (obligated) to their initial mothership until the permit participates for a year in the non-co-op fishery. After spending a year in the non-co-op fishery, the portion of the catcher-vessel permit's deliveries that are obligated may be moved to a different processor but are then tied to that new processor until they once again participate for a year in the non-co-op fishery.

Two versions of the **shoreside co-op program** are being considered. Under one version there would be no constraints on the processors that participate and deliveries of permits would not be tied to a particular processor. Under the other version, during the first two years of the program, shoreside processors that are not “co-op eligible” (do not have enough qualifying history) would not be able to receive whiting from the whiting harvester co-ops (as described above). Permit holders opting to participate in a co-op would be tied to processors until the permit participates for a given time (possibly a year or more) in the non-co-op fishery. Within the version of the program that includes ties to processors, there are two options for permit-processor ties after the initial years of the program. Under one option, after the first two years, permits that move into a co-op would not be tied to a processor. Under the other option, ties would be established with a processor any time a permit moves into a co-op (similar to the mothership program).

The **catcher-processor (CP) sector** is already organized as a co-op through a voluntary private agreement. The co-op alternative would provide some additional stability to the co-op by capping the number of permits eligible to participate in the CP sector. Currently, new limited entry permits may be moved into the CP sector though the combination of smaller trawl permits into a permit large enough for a catcher-processor vessel.

Table 2-1. Comparison of the action alternatives.

Program Components	IFQ Alternative for Nonwhiting & Whiting	Co-op Alternative for Whiting		
		Mothership Program	Shoreside Program	Catcher-Processor (CP) Program
Sector Allocation	Allocation between the trawl an other sectors and among the various trawl sectors will be set in a separate but linked process			
Catcher Vessel LE Permit Requirement	LE permit (trawl) required (option to suspend the length endorsement)	New mothership sector whiting endorsement required for mothership deliveries.	New shoreside whiting sector endorsement required for shoreside deliveries.	New CP endorsement required for CP deliveries.
		The new endorsements may or may not be transferable among limited entry trawl endorsed permits.		No endorsement transferability option.
Harvest Allocation of Pacific Whiting Among Participants	QS issued initially to permits, and possibly processors, based on harvest history. Each year QP will be issued to holders of QS.	At the time of initial implementation, whiting harvest history (endorsement shares) are associated with each whiting endorsement. The shares for a particular endorsement never change. NMFS assigns the endorsement's shares to a co-op or the non-co-op fishery, depending on the which fishery the permit holder chooses to fish in.		None (Allocation among participants currently achieved through private co-op agreement among participants)
Harvest Allocation of Nonwhiting Species Among Participants	Same as for whiting but initial allocation for some nonwhiting species may be based on a proxy. (Option: No nonwhiting IFQ for whiting deliveries, bycatch managed as a pool with caps)	There are options for whether or not bycatch species will be allocated in aggregate for all whiting sectors, among whiting sectors, between the co-op and non-co-op fisheries, or among co-ops. If nonwhiting (bycatch) species are allocated between the co-op and non-co-op fisheries or to individual co-ops, bycatch species would be allocated among endorsements based on the endorsement's whiting history.		Same as above.
Monitoring, Transfers, and Catch Control	NMFS monitors at the vessel level, including at-sea catch (restricting the fishery as needed) & monitors QS/QP transfers to a wide class of persons, including anyone eligible to own a U.S. fishing vessel.	NMFS monitors harvest at the sector, co-op/non-co-op and co-op levels, closing segments as needed, but does not monitor inseason transfers of catch opportunities. Co-ops may join together in inter-co-ops, in which case NMFS would track catch of the inter-co-op rather than the co-op. If endorsement transfer is allowed, NMFS would record and track those transfers. Co-ops control inseason transfers and the catch of their members. Non endorsed permits may join co-op and fish the allocation of endorsed permits (upon mutual agreement).		NMFS monitors and closes the sector as needed. Distribution of harvest among vessels is currently managed under a private co-op agreement.
Processor Participation Restriction	None	Limited entry for motherships	Either no restriction or a two-year restriction on those eligible to receive from co-ops ("co-op eligible" processors)	New endorsement for participation as a CP
Other Processor Provisions	Example Options: Allocation of QS/QP to processors; possible compensation through adaptive management.	Processor tie (all or part of a permit's catch would be obligated to a particular mothership via a processor tie). (Permits opting to participate in a co-op are tied to the mothership until the permit spends a year in the non-co-op fishery).	Either no tie or a processor tie (Permits opting to participate in a co-op are tied to processors until the permit participates the required time in the non co-op fishery. Option: Permits that move into a co-op after the first two years are not tied to a processor.	None

2.3 Status Quo (No Action) Alternative

The groundfish FMP describes the management framework for the groundfish trawl fishery. Analyses of biennial harvest specifications and management measures {PFMC, 2006 1407 /id /pt "For example, "} evaluate the periodic implementation of the management framework. The description of alternatives in these documents gives a picture of how the management framework is implemented on a periodic basis. Section 3.x provides an overview of the current management system and can serve as a general description of the status quo. This section describes status quo management of the limited entry trawl sector.

Chapter 4 in the Groundfish FMP describes how MSY is estimated, criteria for determining stock status, procedures for addressing overfishing and overfished stocks, and based on these procedures, how annual OYs are set. Chapter 5 describes the biennial process for specifying OYs and how they may be adjusted "inseason," or during the 2-year period covered by the biennial specification. Council action occurs over an 8-month period prior to the beginning of the first year in the biennial period. For example, the Council began work on the 2009–10 harvest specifications at their November 2007 meeting by adopting a preliminary range of OYs, based on information from stock assessments or other procedures. (Section 4.6 in the Groundfish FMP describes how OYs should be specified depending on the amount of information available about a stock. Stock assessments are developed through a Council-managed peer review process that culminates with adoption of stock assessment results in advance of the specifications process.) At the April 2008 Council meeting, preliminary preferred OYs are adopted and a range of management measures consistent with these OYs are identified. At the June 2008 meeting the Council takes final action to adopt the full suite of preferred OYs and management measures. This represents a recommendation to NMFS for the Federal regulations necessary to implement the management measures. A lengthy rulemaking process is required, ending with the implementation of the regulations on January 1, 2009.

Table 2–1 in the 2007–08 harvest specifications EIS {PFMC, 2006 1407 /id} shows the ABC and OY values adopted by the Council for that 2-year period. For the purposes of management, the Council set OYs for 38 stocks or stock complexes. (In some cases OYs may be set for components of a stock complex, but the overall OY is used as a harvest guideline.) OYs are generally construed as harvest guidelines because catches are managed indirectly through landing limits, closed areas, and other operational restrictions. Furthermore, because the fishery is not fully monitored in real time, it cannot be known with absolute certainty when an OY has been reached, which if set as a quota, would require ending the fishery for the year. (Real time monitoring means that catch information is available to managers soon enough after the catches have been made that they can immediately react to the catch level.) The exception is Pacific whiting, which is set as a quota with the fishery fully monitored in real time and closing upon attainment of the OY.

The Council has established fixed allocations, expressed as a percent of the OY, for two stocks: sablefish north of 36° N latitude and Pacific whiting. Nearshore stocks are allocated by the states because they directly manage them, although they coordinate their management through the Council process. (The trawl sector rarely catches these nearshore species.) All other stocks are implicitly allocated; that is, the allocations resulting from a particular suite management measures are taken into account in the process of developing those management measures. For the trawl sector, for example, catches resulting from a set of cumulative landing limits can be projected, indicating the proportion of the OY taken by the sector and the amount available to other sectors. If projected catches diverge from generally agreed fishing opportunity for a sector (an implicit allocation target), then in the harvest specification process the trawl cumulative landing limits (or those established for other sectors) can be adjusted so results match expectations.

OYs for some overfished species—in the case of the trawl fishery, particularly canary rockfish on the continental shelf and darkblotched rockfish on the slope—impose the greatest constraint, translated into a variety of management measures that indirectly limit mortality on the constraining stocks. The whiting fishery is an exception here too; beginning in 2005, the Council has established sector-wide caps for overfished species that effectively serve as a quota limit on the fishery. Problems with this approach have begun to emerge, not only because of the risk of a race for fish related to the low sector caps for these species, but also because of the different timing of the sub-sectors within the whiting sector. The at-sea sector begins fishing earlier than the shore-based sector and thus risks catching a large proportion of an overfished species catch cap, jeopardizing the later-starting sector's opportunity to catch its whiting allocation.

Chapter 6 in the Groundfish FMP describes the range of management measures and catch monitoring programs available to the Council. According to Section 6.1.1 in the FMP the following general categories of management measures are available to the Council:

- Measures to reduce bycatch and bycatch mortality
- Defining authorized fishing gear and regulating the configuration and deployment of fishing gear, including mesh size in nets and escape panels or ports in traps
- Restricting catches by defining prohibited species and establishing landing, trip frequency, bag, and size limits
- Establishing fishing seasons and closed areas
- Limiting fishing capacity or effort through permits, licenses and endorsements, and quotas, or by means of input controls on fishing gear, such as restrictions on trawl size/shape or longline length or number of hooks or pots, or through programs that reduce participation in the fishery by retiring permits and/or vessels

Of these categories, catch restrictions based on cumulative landing limits are the primary measures set for the trawl sector in the biennial specifications process. The boundaries of closed areas—the rockfish conservation areas referenced in Section 1.6—are also often adjusted as part of the biennial process. Although trawl gear restrictions, principally intended to keep trawlers out of rocky habitat (where several of the overfished species are found), are an important part of the management process, these requirements are much less frequently modified. In addition to restrictions on the size of trawl net footropes intended for this purpose, selective flatfish trawl gear, which has shown a lower incidental catch rate for some roundfish, including some overfished species, is required shoreward of the RCA north of Cape Mendocino, California.

Cumulative landing limits are a longstanding feature of the management framework, and were originally implemented on a per-trip basis (thus, confusingly, cumulative landing limits are often referred to as "trip limits"). They worked reasonably well until the need to rebuild overfished stocks became a central concern of the management process. Managing by landings alone then became much less effective because the low landing limits (or no retention rules) established for these stocks led to unacceptable levels of unmonitored bycatch. In order to address this problem NMFS implemented the west coast Groundfish Observer Program, covering the non-whiting trawl sector, in August 2001. The coverage target is to monitor 20 percent of the catch as a proportion of total landings. The whiting fishery, as noted above, is more closely monitored. The at-sea sectors are subject to 100 percent coverage on catcher-processors and motherships. Catcher vessels, whether delivering to shore or motherships must retain all catch. (Mothership catcher vessels deliver the whole cod-end to the processing vessel.) The shore-based sector is monitored at the processing plant.

Although monitoring is much improved, as noted above, for the nonwhiting trawl fishery there is a considerable lag time in the delivery of observer information to managers. Currently, observer reports, which contain bycatch rates that can be used to project total catch mortality, are on an 8-month lag. Total catch mortality rates, which give a retrospective picture of how the fishery performed (or the effectiveness management measures in meeting targets) are on a 1-year lag. Combined with the difficulty in accurately forecasting catches—due to numerous factors affecting the deployment of fishing effort and changes in catch per unit of effort—inseason management action is a regular feature of the management process. As with the biennial setting of management measures, inseason action most commonly modifies cumulative landing limits and the boundaries of the RCA for the trawl fishery.

Other measures affecting the trawl sector are established in permanent regulations and not modified through biennial or inseason action. Important among these are various measures implemented in 2006 and intended to reduce adverse impacts to essential fish habitat. These include gear restrictions and prohibitions and additional areas closed to trawl gear. Measures to control capacity—such as the license limitation and vessel buyback programs described in Section 1.6.4—are another important permanent feature of the current groundfish trawl sector management framework.

2.4 IFQ Alternative

This section details the IFQ alternative. In the first part of the section describes major components of the alternative. The last part (Section 2.4.2) details all of the program features and options in outline form; Table 2-2 summarizes the organization of this outline form. Table 2-3, which starts on page 45, presents the IFQ program features and options at the greatest level of detail. As noted above, Appendix A provides still more detailed descriptions of the program features along with the rationale and evaluation of the approach taken.

2.4.1 Overview of Program Features

Under the alternative, an IFQ will grant an entity the privilege to catch a specified portion of the trawl sector's allocation. Within the IFQ program, vessels will be allowed to use a variety of directed groundfish commercial gear, which will thus allow for "gear switching." For the **shoreside non-whiting sector**, IFQs will be created for all species of groundfish under the Groundfish FMP (although some will still be managed collectively at the stock complex level). For the **whiting sectors**, IFQ will either be created for all species of groundfish, or IFQ might be created only for the target species, Pacific whiting. Under the second option, the allocation of bycatch to the whiting fishery (or to specific whiting sectors) will be managed as fleet catch caps. Reaching the bycatch limit will trigger closure of the whiting fishery (or a specific whiting sector).

Halibut individual bycatch quota (IBQ) may be created and required to cover the incidental catch of Pacific halibut in the groundfish trawl fishery. Under an IBQ program, retention would not be allowed.

The following sections describe the main components of the program.

2.4.1.1 *Initial Allocation*

The program will initially allocate IFQ as quota shares (QS) to fishery participants based mainly on their historic involvement in the fishery. Following the initial allocation, transfers (described below) will allow for others to also participate in the fishery as quota holders. The initial allocation can be viewed in two segments:

First, the Council is considering the groups that should be included in the initial allocation, and the proportional split among the groups. Options range from allocating 100 percent of QS to permit owners in the nonwhiting and whiting trawl sectors to allocating 75 percent to permit owners and 25 percent to processors for the nonwhiting groundfish sector, and 50 percent to permit owners and 50 percent to processors for the whiting sector. Additionally, there are options that would allocate 10 percent of the annual trawl allocation for an adaptive management program.

Second, the Council is considering specific allocation formulas that will determine the amount of QS each eligible entity will receive. These calculations are based on the delivery history associated with a vessel permit or processing company over a set number of years. There is an option that would base the allocation to vessel permit owners entirely on permit delivery history and another that would equally divide the pool of QS associated with the buyback permits (see Section 1.6.4) among the remaining qualified permits. For nonwhiting catcher vessels and shoreside processors, a special calculation is being considered for overfished species to allocate these species based on a QS recipient's need to cover incidental catch under current fishing practices (as measured by bycatch rates, individual permit logbooks, and the amount of target species QS that an entity receives). A similar approach would be used for the allocation of halibut IBQ. For the whiting sector, there is an option to allocate nonwhiting bycatch species on a pro rata basis, according to the amount of whiting QS an entity is issued. Additionally, as explained above, fleet catch caps may be used instead of IFQs to manage bycatch species in the whiting fishery. If this option is chosen, only whiting QS will be allocated.

2.4.1.2 *IFQ Management Units*

QS will be issued for the species groups and areas for which there are OYs (management units). For all OYs for which there is not already a latitudinal subdivision there is an option under which the trawl allocations and QS management units would be subdivided at 40° 10' N latitude. There are also provisions that provide for the subdivision of QS after initial allocation.

2.4.1.3 *Management under IFQs*

In designing the management regime for the IFQ program, the Council is balancing the benefits of flexibility and individual accountability with program costs and the constraints of the very low allowable catch levels of overfished species. Prior to the start of each fishing year, NMFS will issue quota pounds (QP) to entities based on the amount of QS they hold and the overall trawl sector allocation. When a vessel goes fishing under the IFQ program, all catch must be recorded and must be matched by an equal amount of QP from the vessel's QP account. If there is not enough QP to cover the catch from a trip, there is a 30-day grace period during which adequate QP must be transferred into the vessel's account. A vessel's fishing will be limited, and its permit cannot be sold, until the overage is covered. A carryover provision will allow for an overage in one year to be covered by up to 10 percent of the following year's QP; likewise, the provision also will allow QP that were not used in one year to be carried over into the following year, up to 10 percent.

Bycatch reduction and greater efficiency are expected to occur in the groundfish fishery under the IFQ program because of the transferability of QS and QP. As these units are transferred (bought and sold or "leased" through private contract), it is anticipated that those best able to avoid catching overfished species, and those who are most efficient, will increase the amount registered to them, while those who consistently have high bycatch rates or operate less efficiently might choose to sell their QS and leave the fishery. Generally, anyone eligible to own a U.S.-documented fishing vessel could also acquire QS and QP, and the QS and QP could be acquired in very small increments.[14] These provisions will allow for new entrants into the fishery; for example, a crew member could slowly purchase amounts of quota.

[14] To be eligible to own QS the person need not actually own a U.S. documented fishing vessel.

Rewarding bycatch avoidance and efficiency are desired outcomes from the program. In order to protect against unintended consequences, however, two provisions limit transferability. The Council is considering whether to divide the trawl fishery into three or four sectors within the IFQ alternative (under three sectors, the fishery will divide into catcher-processor whiting, mothership whiting, and shoreside; while under four sectors the shoreside sector will divide additionally into shoreside whiting and shoreside non-whiting). QS or QP could not be transferred between the different sectors, so there will be stability in the relative amount of fish caught within each sector. The second provision is to establish accumulation limits on the amount of QS or QP that can be controlled by an entity, and accumulation limits on the amount of QP registered to a vessel. The intent of these limits is to prevent excessive control of quota by a participant. A grandfather clause may allow a person initially allocated QS in amounts in excess of the cap to maintain ownership of those QS.

An option for an adaptive management provision would allow the Council to use 10 percent of the trawl allocation to provide incentives, support, or other compensation to offset adverse impacts of the program.

2.4.1.4 *Tracking and Monitoring*

The monitoring and tracking program necessary and feasible to assure that all catch (including discards) is documented and matched against QP is under development. Currently, 100 percent coverage by at-sea compliance monitors/observers is prescribed in the IFQ alternative (though it may be possible in certain situations to use cameras to assure compliance). Compared to status quo monitoring, this will be a significant increase for a large portion of the trawl fleet, particularly non-whiting shoreside vessels. Resulting more accurate estimates of total mortality will have benefit stock conservation goals. Discarding may be allowed, though all fish discarded will also have to be covered by QP. A number of other elements of the monitoring program are being considered, including the level of shoreside monitoring, whether to limit landing ports or landing hours, the expansion of the state fish ticket system into an electronic Federal system to track trawl landings, and a small vessel exception, if feasible. Additionally, a program for the mandatory submission of economic data is included to facilitate monitoring program performance.

2.4.1.5 *Costs and Fee Structure*

Program costs are of concern and are under assessment. Fee structures will be proposed to recover program costs, and a fee structure aligned with usage level will be considered. The extent to which management system elements will be privatized under the program is also being considered. Work on the cost and fee structure is proceeding.

2.4.1.6 *Special Provisions for Processors*

A number of special provisions are being considered to address processor concerns. These include the provision of an initial allocation to processors. Consideration is being given to:

- Limiting the duration of the QS initially issued to processors
- Not allowing processors to use the accumulation limit grandfather clause mentioned above (i.e., processors would not be allowed to use the clause to acquire QS in excess of the accumulation limits based on their processing history)
- Using some of the trawl allocation set aside for adaptive management to compensate for adverse impacts on processors.

2.4.1.7 *Fixed Term and Auctions (Option)*

The Council is considering an option that will limit the term of all QS issued to 15 years (except that the Term-1 QS may last 15 or 16 years, depending on when the biennial specification period ends). Starting with Term-2 of the program, every two years up to 20 percent of all QS will be returned to NMFS for reissuance via an auction. The specific form of the auction will be decided by the Council in the period between trawl rationalization implementation and the first auction. It will be designed to achieve the goals of the trawl rationalization program, including reducing bycatch; increasing operation flexibility; and producing measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.

2.4.2 Detailed Specification of IFQ Program Features and Options

The following text summarizes the details of the IFQ program. Table 2-2 provides an overview of the organization of the sections of the program and Table 2-3 (beginning on page 45) provides a complete description.

Table 2-2. Organization of the IFQ alternative program features and options.

A-1		***Trawl Sector Management Under IFQs***
	A-1.1	Scope for IFQ Management (includes gear switching) **(Also see Section A-5)**
	A-1.2	IFQ Management Units (includes latitudinal area management)
	A-1.3	General Management and Trawl Sectors"
	A-1.4	Management of Nonwhiting Trips
	A-1.5	Management of Whiting Trips
	A-1.6	Groundfish Permit Length Endorsements
A-2		***IFQ System Details***
	A-2.1	Initial Allocation and Direct Reallocation
	A-2.2	Permit/IFQ Holding Requirements and Acquisition (Includes Annual Issuance and Transfer Rules)
	A-2.3	Program Administration (Includes Tracking, Data Collection, Costs, Duration)
	A-2.4	Additional Measures for Processors
A-3		***Adaptive Management (Option)***
A-4		***Pacific Halibut Individual Bycatch Quota (IBQ) – non-retention (Option)***
A-5		***Alternative Scope for IFQ Management (Option)***
A-6		***Alternative Duration: Fixed Term (and Auctions) (Option)***

A. Trawl Sector Management under IFQs

A-1.1 Scope for IFQ Management, Including Gear Switching

- Catch-based system
- QP required to cover all groundfish species catch (including all discards)

This implies gear switching is allowed (vessels with limited entry trawl permits can use directed groundfish gears (including open access, longline, and fishpot) to harvest their QP.

See Section A-5 for an alternative specification of the scope for whiting trips.

A-1.2 IFQ Management Units, Including Latitudinal Area Management

QS/QP will be for the species and species groups specified in the ABC/OY table produced as part of biennial harvest specifications. This includes any area subdivisions of stocks indicated in the table and QP cannot be transferred between areas. QS/QP is issued specifically to manage the trawl sector and will not be used in a nontrawl sector (i.e., by vessels without trawl permits). However, a vessel with a limited entry trawl permit may catch the trawl QP with a nontrawl gear, as noted above in Section A-1.1.

Option: For species with a coastwide OY, the QS will be subdivided geographically at the 40° 10’ N latitude line.

A-1.3 General Management and Trawl Sectors

Unless otherwise specified, status quo regulations, other than trip limits, will remain in place, including season closures and area restrictions, as necessary.

There will be
Option 1: Three trawl sectors: shoreside, mothership, and catcher-processors.
Option 2: Four trawl sectors: shoreside nonwhiting, shoreside whiting, mothership, and catcher-processors.

Allocation among trawl sectors to be determined in the intersector allocation process.

A-1.4 Management of Nonwhiting Trips

Nonwhiting trips are those with less than 50 percent whiting. No changes to existing management measures other than those specified in Section A-1.3, have been identified at this time.

A-1.5 Management of Whiting Trips

Whiting seasons will not be changed under the TIQ program.

When the primary whiting season is closed:

- If 3 sectors: For shoreside deliveries, sector specific QP required plus cumulative whiting catch limits apply. Deliveries prohibited for at-sea sectors.
- If 4 sectors: Whiting sectors prohibited from delivering.

A-1.6 Groundfish Permit Length Endorsements

Option: Limited entry permit length endorsement will not apply to vessels using limited entry trawl gear.

A-2. IFQ System Details

A-2.1 Initial Allocation and Direct Reallocation

A-2.1.1 Eligible Groups

a. Groups and Initial Split of QS

Eligible Groups: The initial allocation of QS will be made either only to permit owners or to permit. owners and processors.

	Nonwhiting Sector QS		Whiting Sector QS	
	Amount to Permits	Amount to Processors	Amount to Permits	Amount to Processors
Option 1	100%	0%	100%	0%
Option 2	87.5%	12.5%	75%	25%
Option 3	75%	25%	50%	50%
Option 4 (10% for Adaptive Management)*	100%	0%	100%	0%
Option 5 (10% for Adaptive Management)*	75%	25%	50%	50%

b. Permits

Permit owner at the time of initial allocation will receive QS as based on permit landing history.

c. Processors and Processing Definition

For the purpose of applying the initial allocation formula, only the first processing counts as processing. A special definition of processors and processing is provided to meet this intent; fish “receivers” may be used as a proxy for “processors.”

d. Attributing and Accruing Processing History

For an allocation to **catcher-processors**, see A-2.1.1-b.

For an allocation to **mothership processors,** history accrues to the vessel on which the at-sea processing occurs.

Option 1: The owner of the vessel at the time of the initial allocation will receive the initial allocation.

Option 2: If a bareboat charter exists, the bareboat charterer will receive the initial allocation

For the **shoreside processor** allocation

Option 1: Attribute history to the receiver reported on the landing receipt.

Option 2: Attribute history to the receiver if that entity meets the definition of processor with respect to trawl-caught groundfish.

Option 3: Same as Option 1, except history may be reassigned to an entity not on the landings receipt, if parties agree or through an agency appeals process.

Successor in interest, as determined by NMFS, will be recognized.

A-2.1.2 Recent Participation

a. Permits

Recent participation is not required in order for a permit to qualify for an initial allocation of QS.

b. Processors (motherships)

Recent participation is required to qualify for an initial allocation of QS: 1,000 mt or more of ground fish in each of any two years from 1997-2003.

c. Processors (shoreside)

Recent participation is required to qualify for an initial allocation of QS:

Nonwhiting Option 1: 1 nonwhiting groundfish trip delivery from 1998-2003.

Nonwhiting Option 2: 6 mt or more of deliveries from nonwhiting groundfish trips in each of any three years from 1998-2003.

Whiting Option 1: 1 whiting trip delivery from 1998-2003.

Whiting Option 2: 1 mt or more of deliveries from whiting trips in each of any two years from 1998-2003.

A-2.1.3 Allocation Formula

a. Permits with catcher vessel history

For all fish management units:

Option 1: All QS allocated based on permit history (see following formulas).

Option 2: An equal division of the buy-back permits' pool of QS among all qualifying permits plus allocation of the remaining QS based on each permit's history (see following formulas).

Permit history based allocation suboptions:

For non-whiting trips, permit history used for QS allocation will be calculated as follows:

For non-overfished species: use an allocation period of 1994-2003. Within that period use relative history and drop the three worst years.

For overfished species <u>taken incidentally:</u>

Overfished Species Option 1: as it is calculated for non-overfished species

Overfished Species Option 2: apply a bycatch rate to target species QS

For whiting trips, permit history used for QS allocation will be calculated as follows:

For whiting, using an allocation period of 1994-2003. Within that period, use relative history and drop the two worst years. The same years must be dropped if a permit is used in both the SS and MS sectors.

For bycatch species (if IFQ is used for bycatch species):

Bycatch Option 1: using history for that species, as it is calculated for whiting
Bycatch Option 2: using the whiting history as a proxy

Area Assignments: Landings history will be assigned to catch areas based on port of landing.

Relative history (%): For each sector, the permit history for each year is measured as a percent of the sector's total for the year.

b. Permits with catcher-processor history

Owners of catcher-processor permits will be allocated whiting QS based on permit history for 1994-2003 (no option to drop years) and using relative history as defined for catcher vessel permits.

For bycatch species (if IFQ is used for bycatch species):
Bycatch Option 1: using history for that species, as it is calculated for whiting
Bycatch Option 2: using the whiting history as a proxy

c. Processors (motherships)

Allocate whiting QS based on the vessel's processing history for 1997-2003 (no option to drop years), and use relative history as defined for catcher vessel permits.

For bycatch species (if IFQ is used for bycatch species):
Bycatch Option 1: using history for that species, as it is calculated for whiting
Bycatch Option 2: using the whiting history as a proxy

d. Processors (shoreside)

For all species other than incidental species, allocate QS based on the entity's history for the allocation period of 1994-2003 (drop two worst years) and use relative history.

For incidental species (overfished species taken incidentally on nonwhiting trips and bycatch species taken on whiting trips) consider the same allocation options identified for permits in Section A-2.1.3.a.

A-2.1.4 History for Combined Permits and Other Exceptional Situations

Permit history for combined permits includes the catch history for all the permits that have been combined. For history catch occurring when trawl permits were stacked, the catch history is split evenly between the stacked permits. Illegal landings, nonwhiting EFP landings in excess of cumulative limits for the non-EFP fishery, and "compensation fish" will not count toward an allocation of QS.

A-2.1.5 Initial Issuance—Appeals

No Council appeals process. NMFS will develop a proposal for an internal appeals process. Accepted revisions to fish tickets are those approved by the state.

A-2.1.6 Direct Reallocation after Initial Issuance

When an overfished species is rebuilt or a species becomes overfished, there may be a change in the QS allocation within a sector. If the geographic configuration of area-specific management units is changed (further subdivision, recombination, or change to the boundaries) QS holdings will be adjusted proportionately. (See Table 2-3, Section A-2.1.6 on page 51 for details.) A similar formula will be used to reallocate shares if a species group is subdivided (e.g., a species currently managed within a complex is removed and managed according to its own OY).

A-2.2 Permit/IFQ Holding Requirements and Acquisition

A-2.2.1 Permit/IFQ Holding Requirement

A limited entry trawl permit is required to use QP for fishing and the QP must be in the vessel's account to cover catch. Catches must be covered by QP within 30 days of when the catch is made, but catch may be covered by QP carried over into the next year, subject to certain restrictions. If a vessel does not have QP to cover catch it may not fish under the IFQ program. A vessel with a deficit may not transfer its LE permit.

- **Option:** There may be some exceptions or additions to the scope of the prohibition on fishing when in QP deficit.
- **Option:** After two years in deficit, a vessel may resume fishing.

A-2.2.2 IFQ Annual Issuance

a. Annual QP Issuance

QP will be issued annually to QS holders.

b. Carryover (Surplus or Deficit)

Non-overfished Species: 10 percent carryover for each species
Overfished Species: 10 percent carryover for each species
Surplus QP may not be carried over for more than one year.

c. Quota Share Use-or-Lose Provisions

None. The need for this provision will be evaluated as part of program review process, and the provision could be added later, if necessary.

d. Entry Level Opportunities

No special provisions. QS are infinitely divisible; new entrants may buy-in through small increments over time.

A-2.2.3 IFQ Transfer Rules

a. Eligible to Own or Hold

Those eligible to own QS/QP will be restricted to those eligible to own and control a U.S. fishing vessel or mothership that participated in the west coast groundfish fishery during the allocation period (see Table 2-3 for additional language).

b. Transfers and Leasing

QS/QP will be transferable and transfers must be registered with NMFS. QS leasing will not be facilitated by NMFS.

c. Temporary Transfer Prohibition

Temporary prohibitions on QS transfers may be imposed, as necessary for program administration (to be determined by NMFS).

Option: QS will not be transferable in the first year of the program (QP will).

d. Divisibility

QS will be highly divisible. QP will be in whole pound units.

e. Accumulation Limits (Vessel and Control)

The amount of QP that may be used with a vessel and the amount of QS or QP a person may control will be limited (termed vessel cap and control cap respectively, see Table 2-4, Section A-2.2.3.e on page 54 for options). The control limit will be based on the individual and collective rule.

A grandfather clause (allowing those initially qualifying for QS in excess of limits may receive and maintain it) may apply to vessel and control accumulation limits.

Option 1: Full grandfather clause.
Option 2: Grandfather clause capped at twice the vessel limits.
Option 3: No grandfather clause.

Note: QS not allocated because of the grandfather clause will be distributed to other eligible recipients based on allocation formulas.

A-2.3 Program Administration

A-2.3.1 Tracking and Monitoring

NMFS will explore the possibility of less than 100 percent at-sea monitoring and report back on the possibility. Tracking and monitoring program component and options are detailed in Table 2-3, Section A-2.3.1 on page55. These cover at-sea discarding, at-sea monitoring, catch tracking mechanisms, cost control mechanisms, and program performance measures.

A-2.3.2 Socio-economic Data Collection

There will be expanded data collection and mandatory compliance of harvesters and processors. Audits may be used to validate data. Include transaction prices in a central QS ownership registry.

A-2.3.3 Program Costs

Options to be refined.

a. Cost Recovery

Option 1: Recover IFQ program costs but not enforcement or science costs. A maximum of 3 percent of ex-vessel value.

Option 2: Full cost recovery through landing fees plus privatization of certain elements of the management system.

b. Fee Structure

To be determined. TIQC recommends a fee structure that reflects usage. Option (to be developed) that allows for equitable sharing of observer costs for smaller vessels.

A-2.3.4 Program Duration and Modification

Starting four years after implementation the program performance will be reviewed every four years by a community advisory committee.

A-2.4 Additional Measures for Processors

Option 1: Any QS received for processing history as part of the initial allocation will expire after a certain period of time (to be determined prior to final Council action).

Option 2: The accumulation limit grandfather clause of Section A-2.2.3.e will not apply for processing history. Processors will not be allowed to use history receiving groundfish to qualify for QS in excess of accumulation limits.

Option 3: The Adaptive Management allocation and process (Section A-3) will be used to compensate processors for demonstrated harm by providing QP to be directed in a fashion that increases benefits for affected processors.

A-3 Adaptive Management (Option)

Annually, 10 percent of the QP will be set aside for use in an adaptive management program to create incentives for developing gear efficiencies, for community development, or to compensate for unforeseen outcomes from implementing the IFQ program.

Should the Council allocate QS to processors, those processors receiving an initial allocation would not be eligible to hold adaptive management QP issuances.

A-4 Pacific Halibut Individual Bycatch Quota (IBQ)—Non-retention (Option)

Option: IBQ for Pacific halibut bycatch in the trawl fishery will be established. Such IBQ will be issued on the basis of a bycatch rate applied to the target species quota shares an entity receives. IBQ will not be geographically subdivided.

A-5 Alternative Scope for IFQ Management (Option)

Option: IFQ will be required to cover all groundfish catch except for bycatch species taken on whiting trips. If this option is adopted a number of sections above would be amended to conform with the option (see Table 2-3, Section A-5 on page 58 for details).

A-6 Duration: Fixed Term (and Auctions) (Option)

Option: The term of all QS issued will be limited to 15 years (except that the Term-1 QS may last 15 or 16 years, depending on when the biennial specification period ends).

Reallocation Sub-option 1: QS will be reallocated to holders at the end of the term, unless the program is otherwise modified.

Reallocation Sub-option 2: Starting with Term-2 of the program, every two years up to 20 percent of all QS will be returned to NMFS for reissuance via an auction, unless the program is otherwise modified.

The specific form of the auction will be decided by the Council in the period between trawl rationalization implementation and the first auction. It will be designed to achieve the goals of the trawl rationalization program.

Table 2-3. Full description of the IFQ Alternatives

	Element	SubElement	
A. *Trawl Sector Management*			
A-1.1	Scope for IFQ Management, Including Gear Switching		QP will be required to cover catch of all groundfish (including all discards) by limited entry trawl vessels using any directed commercial groundfish gear, EXCEPT when such vessels also have a limited entry permit endorsed for fixed gear (longline or fishpot) AND have declared that they are fishing in the limited entry fixed gear fishery. ***See Section A-5 for an alternative specification of the scope for whiting trips.*** For the purpose of the trawl rationalization alternatives, "directed commercial groundfish gear" is defined as all legal commercial groundfish gear including limited entry gear and commercial vertical hook and line, troll and dinglebar gear. *This definition of the scope allows a limited entry trawl vessel to switch to nontrawl groundfish gears, including fixed gear, for the purpose of catching their QP. It also allows a nontrawl vessel to acquire a trawl permit, and thereby use trawl QP to catch the LE trawl allocation using nontrawl gear*.
A-1.2	IFQ Management Units, Including Latitudinal Area Management		QS will carry designations for the species/species group, area and trawl sector to which it applies (see A-1.3 for the list of trawl sectors). The QP will have the same species/species group, area and sector designations as the QS on the basis of which the QP was issued. QP will not be used in a trawl sector other than that for which it was issued, unless specifically allowed, and will not be used in a nontrawl sector (i.e. by vessels without trawl permits).[1] QP will not be used in a catch area or for a species/species group other than that for which it is designated. The species, species groupings and area subdivisions will be those for which OYs are specified in ABC/OY table that is generated through the groundfish biennial specifications process. QS for remaining minor rockfish will be aggregated for the nearshore, shelf, and slope depth strata, as per Table 5. **Option:** Additionally, for species or species groups for which the OY is not geographically subdivided (i.e. there is only a coastwide OY), the QS will be subdivided geographically at the 40°10' north latitude line. Existing geographic lines for other species will be maintained. (If this option is not adopted area divisions will be as specified for OYs in the biennial ABC/OY table, unless changed by the Council). Changing the management units. After initial QS allocation the Council may alter the management units by changing the management areas or subdividing species groups. Section A-2.1.6 provides methods for reallocating QS when such changes are made after initial implementation of the program.[2] *Hereafter, all references to species include species and species group, unless otherwise indicated.*

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
A-1.3	General Management and Trawl Sectors		Unless otherwise specified, status quo regulations, other than trip limits, will remain in place. If individual vessel overages (catch not covered by QP) make it necessary, area restrictions, season closures or other measures will be used to prevent the trawl sector (in aggregate or the individual trawl sectors listed here) from going over allocations.[3] The IFQ fishery may also be restricted or closed as a result of overages in other sectors. There will be: **Option 1:** three trawl sectors: shoreside, mothership, and catcher-processors. **Option 2**: four trawl sectors: shoreside nonwhiting, shoreside whiting, mothership, and catcher-processors. *Allocation among trawl sectors to be determined in the intersector allocation process..*[4] *Trawl vessels fishing IFQ with nontrawl gear will be required to comply with the RCA lines applicable for that gear. Such restrictions, as necessary, will be determined in a separate process.*
A-1.4	Management of NonWhiting Trips		Nonwhiting trips are those with less than 50% whiting. No changes to management measures, other than those identified in Section A-1.3, have been identified at this time.[5]
A-1.5	Management of Whiting Trips[6]		Whiting seasons will not be changed under the TIQ program, and so the current spring openings will be maintained to control impacts on ESA-listed salmon.[7] When the primary whiting season for a sector is closed (see Section A-1.3 for options on the number of trawl sectors) • If there are 3 sectors: for shoreside deliveries, sector specific QP will be required plus cumulative whiting catch limits apply. Deliveries will be prohibited for at-sea sectors. • If there are 4 sectors: whiting sectors will be prohibited from delivering.
A-1.6	Groundfish Permit Length Endorsements		**Option:** Length endorsement restrictions on limited entry permits endorsed for groundfish gear will not apply for vessels using limited entry trawl gear. (This action will not change the application of length endorsement restrictions for vessels using limited entry longline or pot gear).

Table 2-3. Full description of the IFQ Alternatives (continued).

<table>
<tr><th></th><th>Element</th><th>SubElement</th><th></th></tr>
<tr><td colspan="4">A-2. <u>IFQ System Details</u></td></tr>
<tr><td>A-2.1</td><td colspan="2">Initial Allocation and Direct Reallocation</td><td></td></tr>
<tr><td>A-2.1.1</td><td>Eligible Groups</td><td>a Groups and Initial Split of Quota Share</td><td>Eligible Groups The initial allocation of QS will be made either only to permit owners or to permit owners and processors.
<table><tr><td></td><td colspan="2">Nonwhiting Sector QS</td><td colspan="2">Whiting Sector QS</td></tr><tr><td></td><td>Amount to Permits</td><td>Amount to Processors</td><td>Amount to Permits</td><td>Amount to Processors</td></tr><tr><td>Option 1</td><td>100%</td><td>0%</td><td>100%</td><td>0%</td></tr><tr><td>Option 2</td><td>87.5%</td><td>12.5%</td><td>75%</td><td>25%</td></tr><tr><td>Option 3</td><td>75%</td><td>25%</td><td>50%</td><td>50%</td></tr><tr><td>Option 4 (10% for Adaptive Management)*</td><td>100%</td><td>0%</td><td>100%</td><td>0%</td></tr><tr><td>Option 5 (10% for Adaptive Management)*</td><td>75%</td><td>25%</td><td>50%</td><td>50%</td></tr></table>* Annually, 10% of the available QP will be set aside for use in an adaptive management program.

The Council may select other distributions within this range.

Due to limitations on available documentation, fish “receivers” may be used as a proxy for “processors” (see A-2.1.1.d) After initial allocation, trading will likely result in changes in the distribution of shares among permit owners and processors. Additionally, entities that are neither permit owners nor processors may acquire quota shares. (see below: “IFQ/Permit Holding Requirements and IFQ Acquisition”).</td></tr>
<tr><td></td><td></td><td>b Permits</td><td>Landing[8] history will accrue to the permit under which the landing was made. The owner of a groundfish limited entry permit at the time of initial allocation will receive the QS issued based on the permit. (See Section A-2.1.4 on permit combinations and other exceptional situations.)</td></tr>
<tr><td></td><td></td><td>c Processors and Processing Definition</td><td>A special definition of “processor” and “processing” will be used for initial QS allocation. A main intent of the definition is to specify that, if QS is issued for processing, only the first processor of the fish receives an initial allocation of QS. See footnote for definition.[9] However, due to limitations on available documentation, fish “receivers” may be used as a proxy for “processors, as per the following section.</td></tr>
</table>

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
		d Attributing and Accruing Processing History	Use at-sea fishery observer data and weekly processing reports to document history for allocations to **at-sea processors**. For an allocation to **catcher-processors**, see A-2.1.1-b. For an allocation to **mothership processors,** history accrues to the vessel on which the at-sea processing occurs. **MS Option 1:** The owner of the vessel at the time of the initial allocation will receive the initial allocation. **MS Option 2:** If a bareboat charter exists, the bareboat charterer will receive the initial allocation For an allocation for **shoreside processors:** **Option 1:** attribute history to the receiver reported on the landing receipt (i.e. the entity responsible for filling out the state fish ticket). *The fish receiver would serve as a proxy for processor because of limited availability of official documentation on actual processing history.* **Option 2:** attribute history to the receiver reported on the landing receipt, if that entity meets the definition of a processor with respect to trawl caught groundfish. *The option is similar to Option 1 except that the fish receiver would have to demonstrate at least some processing of trawl caught groundfish.* **Option 3:** same as Option 1, except history may be reassigned to an entity not on the landings receipt, if parties agree or through *an agency* appeals process. *The intent of this option is to provide an opportunity for catch history to be assigned to the entity that actually processed the fish.* For shoreside processors, allocations go to the processing business. For all three of the options for accruing history, successor-in-interest will be recognized. NMFS will develop criteria for use in determining the successor in interest with respect to the entities listed on the landings receipts or otherwise covered in one of these options.[10]
A-2.1.2	Recent Participation	a Permits (including catcher-processor[11] permits)	Recent participation is not required in order for a permit to qualify for an initial allocation of QS.
		b Processors (motherships)	Recent participation is required to qualify for QS: 1,000 mt or more of groundfish in each of any two years from 1997-2003.
		c Processors (shoreside)	Recent participation is required to qualify for an initial allocation of QS: **Nonwhiting Option 1:** 1 nonwhiting groundfish trip delivery from 1998-2003. **Nonwhiting Option 2:** 6 mt or more of deliveries from nonwhiting groundfish trips in each of any three years from 1998-2003. **Whiting Option 1:** 1 whiting trip delivery from 1998-2003. **Whiting Option 2:** 1 mt or more of deliveries from whiting trips in each of any two years from 1998-2003.

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
A-2.1.3	Allocation Formula	a Permits with catcher vessel history	For all fish management units, as specified in Section A-1.2: **Option 1:** All QS allocated based on permit history (see following formulas). **Option 2**: An equal division of the buy-back permits' pool of QS among all qualifying permits plus allocation of the remaining QS based on each permit's history (see following formulas). (The QS pool associated with the buyback permits will be the buyback permit history as a percent of the total fleet history for the allocation period. The calculation will be based on total absolute pounds with no other adjustments and no dropped years.) **Permit history based allocation suboptions** For **non-whiting** trips, permit history used for QS allocation will be calculated: **For non-overfished species**: using an allocation period of 1994-2003. Within that period use relative history and drop the three worst years.[12] **For overfished species taken incidentally:**[13]: **Overfished Species Option 1:** as it is calculated for non-overfished species. **Overfished Species Option 2:** use target species QS as a proxy based on the following approach: Apply fleet average bycatch rates to each permit's depth and latitude distributions and target species QS allocations. Fleet average bycatch rates for the areas shoreward and seaward of the RCA and north and south of 40 10 will be developed from West Coast Observer Program data for 2003-2006. For the purposes of the allocation, a permit's QS for each target species will be distributed shoreward and seaward of the RCA and latitudinally based on the permit's logbook information for 2003-2006. If a permit does not have any logbooks for 2003-2006, fleetwide averages will be used.[14] For **whiting** trips, permit history used for QS allocation will be calculated as follows: **For whiting**, using an allocation period of 1994-2003. Within that period, use relative history and drop the two worst years. If a permit participated in both the shoreside and mothership whiting sectors, the same two years must be dropped for calculation of the permit's QS for each sector.[15] **For bycatch species** (if IFQ is used for bycatch species): **Bycatch Option 1:** using history for that species, as it is calculated for whiting **Bycatch Option 2:** using the whiting history as a proxy (i.e. allocation will be pro rata based on the whiting allocation). **Area Assignments:** Landings history will be assigned to catch areas based on port of landing.[16] **Relative history (%).** For each sector, the permit history for each year is measured as a percent of the sector's total for the year.

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
.		b Permits with catcher-processor history	Allocate whiting QS based on permit history[17] for 1994-2003 (do not drop worst years) and using relative history as defined for catcher vessel permits. **For bycatch species** (if IFQ is used for bycatch species): **Bycatch Option 1:** using history for that species, as it is calculated for whiting **Bycatch Option 2:** using the whiting history as a proxy (i.e. allocation will be pro rata based on the whiting allocation).
		c Processors (motherships)	Allocate whiting QS based on a vessel's processing history for 1997-2003 (do not drop worst years) and using relative history as defined for catcher vessel permits. **For bycatch species** (if IFQ is used for bycatch species): **Bycatch Option 1:** using history for that species, as it is calculated for whiting **Bycatch Option 2:** using the whiting history as a proxy (i.e. allocation will be pro rata based on the whiting allocation).
		d Processors (shoreside)	**For all species other than incidental species**, allocate QS based on the entity's history for the allocation period of 1994-2003 (drop two worst years) and use relative history (as defined in Section A-2.1.3.a). **For incidental species** (overfished species taken incidentally on nonwhiting trips and bycatch species taken on whiting trips) consider the same allocation options identified for permits in Section A-2.1.3.a
A-2.1.4	History for Combined Permits and Other Exceptional Situations		Permit history for combined permits will include the history for all the permits that have been combined. For history occurring when two or more trawl permits were stacked, split the history evenly between the stacked permits. History for illegal landings will not count toward an allocation of QS. Landings made under nonwhiting EFPs that are in excess of the cumulative limits in place for the non-EFP fishery will not count toward an allocation of QS. Compensation fish will not count toward an allocation of QS.
A-2.1.5	Initial Issuance Appeals		There will be no Council appeals process on the initial issuance of IFQ. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Only revisions to fish tickets accepted will be those approved by the state. Any proposed revisions to fish tickets should undergo review by state enforcement personnel prior to finalization of the revisions.

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
A-2.1.6	Direct Reallocation After Initial Issuance		Reallocation With Change in Overfished Status. When an overfished species is rebuilt or a species becomes overfished there may be a change in the QS allocation within a sector (allocation between sectors is addressed in the intersector allocation process). When a stock becomes rebuilt, the reallocation will be to facilitate the re-establishment of historic target fishing opportunities. When a stock becomes overfished, QS may be reallocated to maintain target fisheries to the degree possible. That change may be based on a person's holding of QS for target species associated with the rebuilt species or other approaches deemed appropriate by the Council. Reallocation With Changes in Area Management (Changes in management lines are expected to be rare, however, when the occur the following provides for the reallocation of QS in a manner that will give individual QS holders with the same amounts of total QP before and after the line changes.) Area Subdivision: If at any time after the initial allocation an IFQ management unit is geographically subdivided, those holding QS for the unit being subdivided will receive equal amounts of shares for each of the newly created IFQ management units. Area Recombination: When two areas are combined, the QS held by individuals in each area will be adjusted proportionally such that (1) the total QS for the area sums to 100%, and (2) a person holding QS in the newly created area will receive the same amount of total QP as they would if the areas had not been combined. Area Line Movement: When a management boundary line is moved, the QS held by individuals in each area will be adjusted proportionally such that they each maintain their same share of the trawl allocation on a coastwide basis (the fishing area may expand or decrease, but the individual's QP for both areas combined wouldn't change because of the change in areas). In order to achieve this end, the holders of QS in the area being reduced will receive QS for the area being expanded, such that the total QP they would be issued will not be reduced as a result of the area reduction.[18] Those holding QS in the area being expanded will have their QS reduced such that the QP they receive in the year of the line movement will not increase as a result of the expansion (nor will it be reduced). Reallocation With Subdivision of a Species Group: If at any time after the initial allocation an IFQ management unit for a species group is subdivided, those holding QS for the unit being subdivided will receive equal amounts of shares for each of the newly created IFQ management units. For example, if a person holds 1% of a species group before the subdivision, that person will hold 1% of the QS for each of the groups resulting from the subdivision.
A-2.2	**Permit/IFQ Holding Requirements and Acquisition** **(after initial allocation)**		

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
A-2.2.1	Permit/IFQ Holding Requirement		1. Only vessels with limited entry trawl permits are allowed to fish in the trawl IFQ fishery. 2. For a vessel to use QP, the QP must be in the vessel's QP account. 3. All catch taken on a trip must be covered with QP within 30 days of the landing for that trip unless the overage is within the limits of the carryover provision (Section A-2.2.2.b), in which case the vessel has 30 days or a reasonable time (to be determined) after the QP are issued for the following year, whichever is greater. [19] 4. For any vessel with an overage (catch not covered by QP), fishing that is within the scope of the IFQ program will be prohibited until the overage is covered regardless of the amount of the overage .Vessels which have not adequately covered their overage within the time limits specified in paragraph 2, must still cover the overage before resuming fishing, using QP from the following year(s), if necessary. If a vessel covers it overage, but coverage occurs outside the specified time limit (paragraph 2), the vessel may still be cited for a program violation. **Option:** There may be exceptions and additions to the activities which will be prohibited when a vessel has an overage (see footnote)[20] 5. For vessels with an overage, the limited entry permit may not be sold or transferred until the deficit is cleared. 6. **Option:** After two years in deficit, a vessel may resume fishing .
A-2.2.2	IFQ Annual Issuance	a Annual Quota Pound Issuance	QP will be issued annually to QS holders based on the amount of QS held. *As specified above, QS holders will have to transfer their QP to a vessel account in order for those QP to be used.*
		b Carryover (Surplus or Deficit)	A carryover allowance will allow surplus QP in a vessel's QP account to be carried over from one year to the next or allow a deficit in a vessel's QP account for one year to be carried over and covered with QP from a subsequent year. Surplus QP may not be carried over for more than one year. A vessel with a QP **surplus** at the end of the current year will be able to use that QP in the immediately following year, up to the limit of the carryover allowance (see below). A vessel with a QP **deficit** in the current year will be able to cover that deficit with QP from the following year without incurring a violation if (1) the amount of QP it needs from the following year is within the carryover allowance (see below), and (2) the QP are acquired within the time limits specified in A-2.2.1.[21] **Carryover Allowance**: Limit of up to 10 percent carryover for each species. This applies to both non-overfished species and overfished species. The percentage is calculated based on the total pounds (used and unused) in a vessel's QP account for the current year.[22] *Note: This provision relates only to carry-over of what is in the vessel's account. Should consideration be given to carryover of QP that are not transferred to a vessel account?*
		c Quota Share Use-or-Lose Provisions	None. The need for this provision will be evaluated as part of program review process, and the provision could be added later, if necessary.

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
		d Entry Level Opportunities	Under the MSFCMA, the Council is required to consider entry level fishermen, small vessel owners, and crew members, and in particular the possible allocation of a portion of the annual harvest to individuals falling in those categories. No special provisions have been identified for analysis, given that new entry is addressed indirectly by allowing crew, captains and others to acquire QS in small increments.
A-2.2.3	IFQ Transfer Rules	a Eligible to Own or Hold	Those eligible to own QS/QP will be restricted to (i) any person or entity eligible to own and control a US fishing vessel with a fishery endorsement pursuant to 46 USC 12108 (general fishery endorsement requirements) and 12102(c) (75% citizenship requirement for entities) and (ii) any person or entity that owns a mothership that participated in the West Coast groundfish fishery during the allocation period and is eligible to own or control that US fishing vessel with a fishery endorsement pursuant to Sections 203(g) and 213(g) of the AFA.
		b Transfers and Leasing	QS/QP will be transferable and transfers must be registered with NMFS. NMFS will not differentiate between a transfer for a lease and a permanent transfer.[23]
		c Temporary Transfer Prohibition	NMFS may establish temporary prohibitions on the transfer of QS, as necessary to facilitate program administration. **Option:** QS will not be transferred in the first year of the program (QP will be transferable).
		d Divisibility	QS will be highly divisible and the QP will be transferred in whole pound units (i.e. fractions of a pound could not be transferred)

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
		e Accumulation Limits (Vessel and Control)	Limits[24] may vary by species/species group, areas, and sector. See options for each sector listed in Table 2-4. **Vessel Use Limit:** A limit on the QP that may be registered for a single vessel during the year. This element will mean that a vessel could not have more used and unused quota pounds registered for the vessel than a predetermined percentage of the QP pool. **Own or Control Accumulation Limit:** A person, individually or collectively, may not control QS or QP in excess of the specified limit (unless exempted by the grandfather clause). QS or QP controlled by a person shall include those registered to that person, plus those controlled by other entities in which the person has a direct or indirect ownership interest, as well as shares that the person controls through other means. The calculation of QS or QP controlled by a person will follow the "individual and collective" rule. Individual and Collective Rule: The QS or QP that counts toward a person's accumulation limit will include (1) the QS or QP owned by them, and 2) a portion of the QS or QP owned by any entity in which that person has an interest. The person's share of interest in that entity will determine the portion of that entity's QS or QP that counts toward the person's limit.[25] **Grandfather Clause:** **Option 1:** A grandfather clause will apply to (1) vessel accumulation limits and (2) control accumulation limits. This clause allows a person, if initially allocated QS in amounts in excess of the cap, to maintain ownership of the QS. The grandfather clause will expire with a change in ownership[26] of the QS. If the owner divests some of the QS, the owner may not reacquire QS or QP until the owner is under the cap. Once under the cap, the grandfather clause expires and additional QS or QP may be acquired but not in excess of the control caps. **Option 2:** Same as Option 1 but the maximum allowed under the grandfather clause will be twice the vessel accumulation limit. **Option 3:** There will not be a grandfather clause. *Note: Absent guidance otherwise, Options 2 and 3 will be implemented in such a manner as to not alter other provisions of the program. Specifically, QS that is not allocated because of the limit or absence of the grandfather clause will be distributed to other eligible recipients in a manner that maintains the distribution among groups specified in A-2.1.1 and based on the allocation formulas specified in A-2.1.3.*
A-2.3	**Program Administration**		

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
A-2.3.1	Tracking, Monitoring and Enforcement NMFS will explore the possibility of less than 100% at-sea monitoring and report back on the possibility.		**Discarding** **<u>Tracking and Monitoring (T&M) Program Alt 1</u>:** Discarding of ITQ species *allowed* in limited entry non-whiting trawl fisheries <u>Non-whiting</u> *Discarding of ITQ allowed, d*iscarding of IBQ required, discarding of non-groundfish species allowed <u>Shoreside whiting</u> *Maximized retention vessels:* Discarding of ITQ, IBQ, and non-groundfish species prohibited *Vessels sorting at sea:* Discarding of ITQ allowed, discarding of IBQ required, discarding of non-groundfish species allowed <u>At-sea whiting</u> Discarding of ITQ allowed by processors, discarding of IBQ required by processors, discarding of non-groundfish species allowed by processors, mothership catcher vessels prohibited from discarding catch **<u>T&M Program Alt 2</u>:** Discarding of ITQ species *prohibited* in limited entry non-whiting trawl fisheries <u>Non-whiting</u> *Discarding of ITQ species prohibited, discarding of non ITQ commercial species prohibited, d*iscarding of IBQ required, discarding of non-groundfish species allowed except retention of prohibited species would be required <u>Other Sectors</u> Same As Alt Program 1 **At Sea Catch Monitoring** <u>Nonwhiting –</u> <u>T&M Program Alt 1:</u> The sorting, weighing and discarding of any ITQ or IBQ species must be monitored by an observer with supplemental video monitoring. <u>T&M Program Alt 2:</u> The sorting of catch must be monitored by an observer. The weighing and discarding of any IBQ species must be monitored by an observer. The retention of ITQ species monitored by the observer. <u>Shoreside whiting</u> *For maximized retention vessels*: video monitoring as proposed under Amendment 10. **Suboption:** Observers would be required in addition to or as a replacement for video monitoring. *For vessels that sort at sea:* The sorting, weighing and discarding of any ITQ or IBQ species must be monitored by an observer with supplemental video monitoring. <u>At-sea whiting</u> *Motherships, catcher vessels and catcher/processors*: The sorting, weighing and discarding of any ITQ or IBQ species must be monitored by an observer with supplemental video monitoring on all catcher vessels. Supplemental video monitoring on processors may also be used. **Shoreside Catch Monitoring** <u>Non-whiting</u> The sorting, weighing and reporting of any ITQ or IBQ species must be monitored by a catch monitor or qualified observer. <u>Shoreside whiting</u> The sorting, weighing and reporting of any ITQ or IBQ species must be monitored by a catch monitor. *(Description continued on next page.)*

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
			(...continued from previous page) **Catch Tracking Mechanisms** **Electronic vessel logbook report** Non-whiting, shoreside whiting and at-sea whiting VMS-based electronic logbook required to be transmitted from vessel. At-sea entry by vessel personnel required including catch weight by species and if retained or discarded **Vessel landing declaration report** Non-whiting and shoreside whiting Mandatory declaration reports **Electronic ITQ landing report** Non-whiting and shoreside whiting Mandatory reports completed by processors and similar to electronic fish ticket report **Processor production report** Non-whiting, shoreside whiting and at-sea whiting Mandatory reports (possible inclusion of proprietary data included to be recommended as option is fleshed out) **Cost Control Mechanisms** **Landing hour restrictions N**on-whiting and shoreside whiting **T&M Program Alt 1:** Landing hours not limited **T&M Program Alt 2:** Limit landing hours **Site licenses** Non-whiting and shoreside whiting Mandatory license, can be issued to any site that meets the monitoring requirements **Vessel Certification** Non-whiting, shoreside whiting and at-sea whiting Mandatory certification, can be issued to any vessel that meets the monitoring requirements **Program Performance Measures** Integrate into the tracking and monitoring program the collection of data on cost, earnings and profitability; Economic efficiency and stability; capacity measures; net benefits to society; distribution of net benefits; product quality; functioning of quota market; incentives to reduce bycatch; market power; spillover effects into other fisheries; contribution to regional economies (income and employment); distributional effects/Community Impacts; employment-seafood catching and processing; safety; bycatch and discards; administrative, enforcement, and management costs. (See A-2.3.2)
A-2.3.2	Socio-Economic Data Collection[27]		The data collection program will be expanded and submission of economic data by harvesters and processors will be mandatory. Random and targeted audits may be used to validate mandatory data submissions. See footnote for a full description[28] Information on QS transaction prices, will be included in a central QS ownership registry. *NOTE: Data collection may need to start before first year of implementation in order to have a baseline for comparison.*
A-2.3.3	Program Costs Options to be Refined.	a Cost Recovery	**Option 1:** Fees will be used to recover costs associated with management of the IFQ program but not for enforcement or science. The limit on fees will be 3% of ex-vessel value, as specified in the MSFCMA. **Option 2:** There will be full cost recovery. Cost recovery will be achieved through landing fees plus privatization of elements of the management system. In particular, privatization for monitoring of IFQ catch (e.g., industry pays for their own compliance monitors). Stock assessments will not be privatized and the electronic fish ticket system will not be privatized.

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
		b Fee Structure	To be determined. TIQC recommends a fee structure that reflects usage. Option (to be developed) that allows for equitable sharing of observer costs for smaller vessels.
A-2.3.4	Program Duration and Modification		Four-year review process to start four years after implementation. Community advisory committee to review IFQ program performance.
A-2.4	**Additional Measures for Processors**		**Option 1:** Any QS received for processing history as part of the initial allocation will expire after a certain period of time (to be determined prior to final Council action). At that time all remaining QS will be adjusted proportionally so that the total is 100%. **Option 2:** The accumulation limit grandfather clause of Section A-2.2.3.e will not apply for processing history. Regardless of the percent of the total QS designated for processors, processing history will not entitle a person to receive QS in excess of the accumulation limits. **Option 3:** The Adaptive Management allocation and process (Section A-3) will be used to compensate processors for demonstrated harm by providing QP to be directed in a fashion that increases benefits for affected processors.
A-3	***Adaptive Management (Option)***		Annually, 10% of the available QP for the trawl IFQ program will be set aside for use in an adaptive management program that could create incentives for developing gear efficiencies, or community development or to compensate for unforeseen outcomes from implementing the IFQ program. Examples of unforeseen outcomes include, but are not limited to, unexpected geographic shifts in the distribution of catch or landings, unexpected effects on certain segments of the industry (e.g. processors), or an unexpected barrier to new entry into the fishery. Should the Council adopt initial allocation of **fishing QS** to processors, those processors receiving an initial allocation would not be eligible to hold QP issued through an adaptive management program. This provision will apply to the overall trawl sector (whiting and non-whiting).
A-4	***Pacific Halibut Individual Bycatch Quota (IBQ) – non-retention (Option)***		Option: IBQ for Pacific halibut bycatch in the trawl fishery will be established. Such IBQ will be issued on the basis of a bycatch rate applied to the target species quota shares an entity receives in a manner similar to that described in Section A-2.1.3.a, Overfished Species Option 2. Area specific bycatch rates may be used for allocation but halibut IBQ will not be geographically subdivided.

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
A-5	***Alternative Scope for IFQ Management (Option)***		**Option:** IFQ will be required to cover all groundfish catch except for bycatch species taken on whiting sector trips. **If this option is selected sections above would be modified as follows.** **Section A-1**. Replace "QP will be required to cover catch of all groundfish (including all discards" with "for non-whiting trips, QP will be required to cover catch of all groundfish (including all discards), for whiting trips, QP will be required to cover catch of all whiting (including all whiting discards but not incidental catch of nonwhiting groundfish species)." If the three sector option is selected in Section A-1.3, then in the previous sentence replace "non-whiting trips" with "shoreside trips" and replace "whiting trips" with "trips delivered at sea." **Section A-1.3** Under the three sector option (shoreside, mothership, and catcher-processors) this alternative scope does not apply to the shoreside sector. For all catch destined for shoreside delivery QP would be required, including catch on trips targeted on whiting. For catch destined for at-sea delivery, QP would be required for whiting but not bycatch species. Under the four sector option, shoreside whiting trips would be included among those for which QP is required to cover whiting and not required for bycatch species. **Section A-1.5.** Whiting trip bycatch species will not be managed with IFQ but will be pooled and managed with bycatch caps. Select one of the following options for incorporation in Section A-1.5: **Bycatch Management Option 1: A single bycatch caps covering all whiting sectors.** All sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species; a controlled pace may be established if the sectors choose to work together cooperatively, potentially forming an intersector/interco-op cooperative. **Bycatch Management Option 2: A single bycatch caps covering all whiting sectors and seasonal releases.** Same as Option 1, including the potential for forming co-ops, except there will be seasonal releases of bycatch allocation.[29] **Bycatch Management Option 3: A separate bycatch caps for each sector.** Each sector closes when its bycatch cap is reached. **Bycatch Management Option 4: A separate bycatch cap for each sector and a roll-over.** Each sector closes when its bycatch cap is reached. Unused bycatch may be rolled over from one sector to another if the sector with unused bycatch has used its full allocation of whiting or participants in the sector do not intend to harvest the remaining sector allocation.

Table 2-3. Full description of the IFQ Alternatives (continued).

	Element	SubElement	
A-6	***Duration: Fixed Term (and Auctions) (Option)***		**Fixed Term Option:** The term of all QS issued will be limited to 15 years (except that the Term-1 QS may last 15 or 16 years, depending on when the biennial specification period ends). Starting with Term-2 of the program, **Reallocation SubOption 1:** QS will be reallocated to holders at the end of the term, unless the program is otherwise modified. **Reallocation SubOption 2:** Starting with Term-2 of the program, every two years up to 20% of all QS will be returned to NMFS for reissuance via an auction, unless the program is otherwise modified. **If the fixed term option is selected, sections above would be modified as follows.** **Section A-2.3.4.** Add the following. The initial allocation of QS will be valid for a period of 15 or 16 years (ending at the end of the second year of the biennial specification period). Thereafter, in the absence of actions to end or amend the program, QS will be issued for 15 year terms (i.e. all QS will expire every 15 years) on the following basis. **Section A-2.1.6.** Add the following. **Reallocation Option 1:** After initial issuance, for the start of each subsequent term of the program, QS will be reallocated to current QS holders (those holding the QS on the day the term expires), in proportion to the amounts they held on the day of expiration, unless the program is otherwise modified, **Reallocation Option 2** After initial issuance, for the start of each subsequent term of the program, up to 20% of the QS will be reallocated in an auction with the remainder going to the current QS holders (those holding the QS on the day the term expires), in proportion to the amounts they held on the day of expiration, unless the program is otherwise modified. Additionally, every two years during the term up to 20% of each holder's QS will return to NMFS for redistribution via an auction. All auctions for the QS to be redistributed will be held at least one year in advance of the actual redistribution. When the redistribution occurs, the QS will come from those holding it at the time of the redistribution and go to the winners of the auction. The specific form of the auction will be decided by the Council in the period between trawl rationalization implementation and the first auction. It will be designed to achieve the goals of the trawl rationalization program, including reducing bycatch, increasing operation flexibility, measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.

Table 2-3. Full description of the IFQ Alternatives (continued).

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[1] Not withstanding this provision, a vessel with a limited entry trawl permit may catch the trawl QP with a nontrawl gear, as per Section A-1.1.

[2] Such changes in latitudinal area management may occur as a result of changes in the management areas for species/species complexes in the ABC/OY table or as a result of separate Council action to change the trawl QS by area. In either case, specific Council action will be required to change the management areas and such action will be accompanied by appropriate supporting analysis and public comment opportunity.

[3] The Council authority to establish or modify RCAs will not be changed by this alternative.

[4] The allocation among trawl sectors will be determined as part of the intersector allocation process. The TIQC recommended a number of options for determining the allocation among trawl sectors. One of these would have based the allocation on fleet history but not have included in the fleet history the history of any vessel not meeting the recent participation requirement. The Council rejected this application of a recent participation requirement to a determination of fleet history. The remaining TIQC options recommend that the division of allocation among trawl sectors be based on the fleet history over the same time periods used to allocate QS. The TIQC further recommends that if different periods are used for different trawl sectors, either (1) calculate the share for each sector based on its IFQ allocation period, then adjust all percentages proportionately such that they sum to 100%; OR (2) use the shortest period common to the allocation formula for all sectors.

If bycatch in the whiting sectors is not managed with IFQs and is pooled at the overall whiting fishery or sector level, allocations of bycatch will be determined through the intersector allocation process. The TIQC recommends allocation among the whiting sectors based on: Option 1: pro rata in proportion to the whiting allocation, or Option 2: weighted historical catch formula (for example, in projecting bycatch in the whiting fisheries prior to the start of the season, the GMT uses a four-year weighted average starting with the most recent year: 40%, 30%, 20%, 10%).

[5] For the nonwhiting fishery there is a potential that a vessel might make a targeted whiting trip by accumulating whiting QPs provided to cover whiting bycatch in the nonwhiting fishery. This could create a problem if it occurred during a time when the whiting fishery is closed to control for impacts on ESA listed salmon. Other than that whiting targeted trips using whiting QP intended for whiting bycatch in the nonwhiting fishery might not create a problem. Restrictions might be imposed on whiting catch in the nonwhiting fishery as needed to address concerns ESA concerns.

[6] A whiting QP rollover provision was considered but rejected from further analysis. This provision would have allowed unused QP to be reclassified so that they could be used in any whiting sector.

[7] The current process for changing the whiting fishery opening dates involves a regulatory amendment developed under the FMP through a framework process. Implementation of an IFQ program should not change this process

[8] The term “landing,” as defined in the regulations, includes both shoreside and at-sea deliveries.

[9] “**Processors”**

At-sea processors are those vessels that operate as motherships in the at-sea whiting fishery and those permitted vessels operating as catcher-processors in the at-sea whiting fishery.

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.” 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 allocations.

Table 2-3. Full description of the IFQ Alternatives (continued).

"Shoreside Processing" is defined as either of the following:

1. Any activity that takes place shoreside; and that involves:

cutting groundfish into smaller portions; OR

freezing, cooking, smoking, drying groundfish; OR

packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.

2. The purchase and redistribution into a wholesale or retail market of live groundfish from a harvesting vessel.

[10] Transfer of physical assets alone should not be considered a basis for successor in interest. Business relationships such as transfer of the company name and customer base might be reasonable evidence of successor in interest.

[11] If a catcher-processor consensus formula is used, recent participation will not be applied.

[12] State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries and observer data will be used for deliveries to motherships.

[13] The intent is to consider an alternative allocation method QS for overfished species which, at reduced harvest levels, are needed primarily to cover incidental catch in fisheries that target healthy stocks. The alternative method (Option 2) would attempt to allocate the species to those who will be receiving QS for related target species. By allocating overfished species QS to those most in need of it, such an allocation would be expected to reduce transition costs. Currently, the list of overfished species that fall into this category is as follows: canary rockfish, darkblotched rockfish, Pacific Ocean perch, widow rockfish, yelloweye rockfish. This list may change by the time the program is ready to be implemented. If a major target species became overfished, it would not be intended that such a species would be allocated via an alternative method (for example species such as Dover sole, sablefish, or Pacific whiting).

[14] In order to determine an amount aggregate target species to which bycatch rates will be applied, each vessels QS will be multiplied by the trawl allocation at the time of implementation.

[15]State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries and observer data will be used for deliveries to motherships.

[16] Catch area data on fish tickets are not considered reliable. It is often filled out by fish receivers that assume the vessel has been fishing in nearby ocean areas. Therefore it will be assumed that all catch comes from ocean areas near the port of landing.

[17] Permit history from observer data

[18] Unless there is a change in the total OY or other factors affecting trawl allocation for the areas involved, in which case their change in quota pounds would be proportional to the change in the trawl allocation.

[19] QP from a subsequent year may not be accessed not until such QP have been issued by NMFS.
[20] Within the scope of the IFQ program.
An overage will not prevent a vessel from using the following gears to target on nongroundfish species, even if there is some incidental groundfish catch:
Salmon troll

Table 2-3. Full description of the IFQ Alternatives (continued).

HMS troll gear and other legal surface hook- that also qualify as vertical hook-and-line or dinglebar under the groundfish FMP.
Outside the scope of the IFQ program
An overage **will not** prevent a vessel from fishing using:
Dungeness crab gear
All other HMS gears (including pelagic longline) except small mesh gillnet
Purse seine for coastal pelagic species
An overage **will** prevent a vessel from using: small mesh gillnet for highly migratory species.

Provisions based on Amendment #6 to Motion 20 at the November, 2007 Council meeting.

[21] Carryover of deficits provides some flexibility to use pounds from a year to cover a deficit from a previous year. Without a carryover provision, a vessel would still need to use pounds in a subsequent year to cover an overage but would incur a violation.

[22] There has been some GMT discussion of a possible need for the QP surpluses carried over to a following year be adjusted proportionally in the following year if the trawl allocation for the following year changes.

[23] QS may be transferred on a temporary basis through private contract (leased) but NMFS will not track lease transfers differently than any other transfer.

[24] In this section, the term “permit” was changed to “vessel” to be consistent with Section A-2.1.3 which indicates that QP go into vessel accounts, not permit accounts. The term “own or control” was shortened to “control” for simplicity. Control includes ownership and therefore.

[25] For example, if a person has a 50% ownership interest in that entity then 50% of the QS owned by that entity will count against the individual's accumulation limit.

[26] **Change in Ownership definition:** For the purpose of the grandfather clause, ownership of a legal entity is defined to change with the addition of a new member to the corporation, partnership or other legal entity. Members may leave without causing the grandfather clause to expire for that entity.

[27] **Data collection, status quo.**
Voluntary submission of economic data for LE trawl industry (status quo efforts)
Voluntary submission of economic data for other sectors of the fishing industry.
Ad hoc assessment of government costs.
Voluntary Provisions: NMFS will continue to support the PSMFC EFIN project attempts to collect economic and social data useful in evaluating the impacts of fishing and fishing regulations.
Central Registry: The program will include no new central registries for QS owners/lessees or limited entry permit owners/lessees other than that necessary to directly support the IFQ tracking and monitoring system, as maintained by the NMFS Permit Office.
Government Costs: Data on the monitoring, administration, and enforcement costs related to governance of the IFQ program will be collected and summarized on an ad hoc basis.

[28] **Data collection:** Expanded **mandatory** submission of economic data:
Mandatory submission of economic data for LE trawl industry (harvesters and processors).
Voluntary submission of economic data for other sectors of the fishing industry.
Include transaction value information in a centralized registry of ownership.

Table 2-3. Full description of the IFQ Alternatives (continued).

Formal monitoring of government costs.

Mandatory Provisions: The Pacific Fishery Management Council and the National Marine Fisheries Service shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data, compliance with which will be mandatory for members of the West Coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl rationalization program and continued through the life of the program. Cost, revenue, ownership, employment and other information will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the program, including achievement of goals and objectives associated with the rationalization program. This data may also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. The program will include targeted and random audits as necessary to verify and validate data submissions. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA. Additional funding (as compared to status quo) will be needed to support the collection of these data. The data collected would include data needed to meet MSA requirements (including antirust).

The development of the program shall include: A comprehensive discussion of the enforcement of such a program, including discussion of the type of enforcement actions that will be taken if inaccuracies are found in mandatory data submissions. The intent of this action will be to ensure that accurate data are collected without being overly burdensome on industry in the event of unintended errors.

Voluntary Provisions: A voluntary data collection program will be used to collect information needed to assess spillover impacts on non-trawl fisheries.

Central Registry: Information on transaction prices will be included in a central registry of QS owners. Such information will also be included for LE permit owners/lessees.

Government Costs: Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the trawl rationalization program.

[29] At the outset, it is envisioned that the seasonal approach will be used to manage widow rockfish bycatch; for canary rockfish and darkblotched rockfish, status quo management will be maintained (i.e., no sector allocation and no seasonal apportionment).

A seasonal release bycatch management program will be implemented through regulation. For reference, a similar program is used to manage halibut bycatch in NPFMC-managed flatfish and Pacific cod fisheries, see 50CFR679.21(d).

In practice, seasonal releases protect the next sector entering the fishery. For example, a May 15-June 15 release will be used by the catcher-processors and motherships, but it protects the shoreside fishery; the June15-September release will be used by shoreside and whatever catcher-processors and motherships are still fishing whiting, and to protect a fall at-sea season after September 15; the final release in September will again be shared by the catcher-processors and motherships, assuming shoreside is done.

For example:

1. No sector bycatch allocations.
2. Status quo for canary and darkblotched rockfish; i.e., no seasonal or sector allocation.
3. May 15 - June 15; 40% of widow hard cap released.

Table 2-3. Full description of the IFQ Alternatives (continued).

4. June 15 - August 31; an additional 45% of widow hard cap released.
5. Sept. 1 - Dec. 31; final 15% of widow hard cap released.
6. Once a seasonal release of widow rockfish is reached, the whiting fishery is closed to all three sectors for that period. The fishery re-opens to all three sectors upon release of the next seasonal release of widow rockfish.
7. Unused amounts from one seasonal release rollover into subsequent release periods.

(Note: percentages are for illustration purposes only, actual release percentages will be developed through the PFMC process).

Table 2-3. Full description of the IFQ Alternatives (continued).

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Table 2-4. Control cap, and vessel cap options to define QS/QP accumulation limits in IFQ Program Alternatives.

Stock	Option 1		Option 2		Option 3	
	Control Cap (%)	Vessel Cap (%)	Control Cap (%)	Vessel Cap (%)	Control Cap (%)	Vessel Cap (%)
All nonwhiting groundfish (in aggregate)	1.5	3.0	2.2	4.4	3.0	6.0
Lingcod - coastwide c/	5	10	7.5	15		
N. of 42 (OR & WA)	5	10	7.5	15		
S. of 42 (CA)	5	10	7.5	15		
Pacific Cod	5	10	7.5	15		
Pacific Whiting			0	0		
Shoreside Sector	10	7.5	15	10	25	12
Mothership Sector	10	25	15	37.5	25	50
Catcher Processors	50	65	55	70	60	75
All Whiting Sectors Combined	15	25	22.5	37.5	40	50
Sablefish (Coastwide)	1.9	3.8	2.9	5.7		
N. of 36 (Monterey north)	2	6.2	3	9.3		
S. of 36 (Conception area)	5	6.2	7.5	9.3		
PACIFIC OCEAN PERCH	5	6.2	7.5	9.3		
Shortbelly Rockfish	5	6.2	7.5	9.3		
WIDOW ROCKFISH	3.4	6.8	5.1	10.2		
CANARY ROCKFISH	5	10	7.5	15		
Chilipepper Rockfish	5	10	7.5	15		
BOCACCIO	5	10	7.5	15		
Splitnose Rockfish	5	10	7.5	15		
Yellowtail Rockfish	5	10	7.5	15		
Shortspine Thornyhead - coastwide	3.1	6.2	4.7	9.3		
Shortspine Thornyhead - N. of 34deg27'	4.8	9.6	7.2	14.4		
Shortspine Thornyhead - S. of 34deg27'	4.7	9.4	7.1	14.1		
Longspine Thornyhead - coastwide	2	4	3	6		
Longspine Thornyhead - N. of 34deg27'	2	4	3	6		
Longspine Thornyhead - S. of 34deg27'	5	10	7.5	15		
COWCOD - Conception and Monterey	5	10	7.5	15		
DARKBLOTCHED	5	10	7.5	15		
YELLOWEYE g/	5	10	7.5	15		
Black Rockfish	5	10	7.5	15		
Black Rockfish (WA)	5	10	7.5	15		
Black Rockfish (OR-CA)	5	10	7.5	15		
Minor Rockfish North	5	10	7.5	15		
Nearshore Species	5	10	7.5	15		
Shelf Species	4	8	6	12		
Slope Species	5	10	7.5	15		
Minor Rockfish South	5	10	7.5	15		
Nearshore Species	5	10	7.5	15		
Shelf Species	5	10	7.5	15		
Slope Species	5	10	7.5	15		
California scorpionfish	5	10	7.5	15		
Cabezon (off CA only)	5	10	7.5	15		
Dover Sole	1.8	3.6	2.7	5.4		
English Sole	10	20	15	30		
Petrale Sole (coastwide) c/	2.9	5.8	4.4	8.7		
Arrowtooth Flounder	5	10	7.5	15		
Starry Flounder	5	10	7.5	15		
Other Flatfish	10	20	15	30		
Other Fish	5	10	7.5	15		

2.5 Whiting Sector Cooperative Alternative

This alternative considers cooperatives, another form of dedicated access privilege, for the whiting fishery. If the co-op alternative is adopted, the Council could still consider adopting the IFQ alternative for the non-whiting shoreside sector only, or maintaining the non-whiting shoreside sector under status quo. Similarly, the Council could adopt co-ops for all or any combination of the three whiting sectors (shoreside, mothership, and catcher processor).

The whiting sector co-op alternative is described generally in the following summary. Following the summary, Table 2-5 provides an outline of the sections of the alternative. A full description of the alternative and its various co-op programs follows this table. The full description starts with a section on general management of the whiting fishery. It is followed by separate sections on each sector of the whiting fishery, describing the co-op program that would apply to that sector.

2.5.1 Overview of Program Features

2.5.1.1 *Whiting Sector Management under Co-ops*

The existing allocation of whiting between the shoreside whiting, mothership, and catcher-processor (CP) sectors will not change under this alternative (42, 24, and 34 percent, respectively). Whiting from one sector could not be transferred to another sector, except possibly through a rollover of excess whiting from a sector that does not have the intent or ability to use it to another sector.

Provisions also address bycatch in the whiting fishery (particularly that of certain overfished species). The Council is considering whether or not to create incidental groundfish species caps for all whiting sectors combined, for each of the whiting sectors, for the co-op and non-co-op fisheries within the mothership and shoreside sectors, or for the co-ops within the mothership and shoreside sectors. If fleet caps are sector specific, an allocation among sectors will be made as part of the intersector allocation environmental impact statement. Within sectors, bycatch allocations would be pro rata, based on the amount of whiting allocated to that sector.

Seasonal releases of bycatch and area closures may be used to control the pace of the fishery. For the mothership and shoreside sectors, the fishery will be divided into a co-op fishery and a non-co-op fishery (for those who do not desire to take part in a co-op). Participants in the non-co-op fishery will not have a claim to any particular amount of the fish allocated to that fishery; therefore the vessels will likely race to harvest the available allocation. Options are being considered that would employ buffers to try to ensure that the non-co-op fishery does not overrun its allocation and fish into the co-op allocation.

NMFS will close the whiting fishery, a particular sector, the co-op or non-co-op fishery within a sector, or individual co-ops, as appropriate, if a whiting catch or bycatch limit is reached. With respect to co-ops, inseason monitoring and closure will be needed only at the highest level of aggregation of the co-ops. For example, if individual co-ops join together to form an inter-co-op that covers the entirety of one of the whiting sectors, then NMFS will track and close at the sector level.

Given the high level of monitoring already in place in the whiting fishery, only moderate changes in monitoring are expected to be needed to implement this alternative for the at-sea whiting fishery. For the at-sea processing segment of the fishery, 100 percent coverage aboard mothership and CPs will continue. For the shoreside whiting fishery, at-sea monitoring will be increased to 100 percent to enforce catch accounting requirements. For some coverage, it may be possible for cameras to be used in place of monitors. Additionally, a program for the mandatory submission of economic data is also included, to facilitate monitoring program performance.

The general provisions for the co-op alternative also include an option for an adaptive management provision that would allow the Council to use 10 percent of the trawl allocation to provide incentives, support, or other compensation to offset adverse impacts of the program.

2.5.1.2 *Co-ops for Catcher Vessels Delivering to Motherships*

Under this program, those who hold whiting-endorsed permits for catcher vessels in the mothership sector will choose each year whether to be part of a co-op or to register to fish in the non-co-op portion of the fishery. The holders of catcher vessel permits with mothership whiting endorsements will form the co-ops. Based on its catch history, each permit that qualifies for a mothership whiting endorsement will be allocated a portion of the history (share) of the mothership sector allocation. There is an option which would allow the endorsements, together with the associated shares, to be transferred as a unit from one LE trawl permit to another. Each year, NMFS will distribute a catch allocation to a catcher vessel co-op based on the sum of the endorsement shares for the permits registered to that co-op. NMFS will also distribute a catch allocation each year to the non-co-op portion of the fishery, based on the collective catch history of the permits opting to participate in the non-co-op fishery.

The co-op organization will coordinate harvest by its members. Although co-op agreements will include a mandatory clause that the catch allocation made to a member must equal the amount that the member brings into the co-op, co-op members may transfer catch allocations among themselves. Similarly, if multiple co-ops join together in an inter-co-op, one co-op will be allowed to transfer catch allocation to another co-op within that inter-co-op. NMFS will not necessarily need to track transfers among co-op members or within an inter-co-op.

The class of motherships will be closed by creating an limited entry permit for mothership vessels. Each catcher vessel permit will be obligated to deliver all or a portion of its catch to a mothership based on past deliveries. There are a number of options for determining which motherships the permit will be obligated to. A catcher vessel permit owner may join a different co-op or deliver to a different mothership than the one to which it is first assigned. However, the permit owner would first be required to enter into the non-co-op portion of the fishery for one year. While catch may be transferred among participants in a co-op or inter-co-op, such transfers would not change the mothership to which the catch is obligated, unless a mutual agreement is reached or other specified circumstances prevail.

As in the IFQ alternative, accumulation limits will be imposed to prevent excessive concentration of catch allocations. They will cap the proportion of whiting that an individual or entity can process and will cap the proportion of whiting an individual or entity could accumulate via ownership of catcher vessel permit(s).

2.5.1.3 *Co-ops for Catcher Vessels Delivering Shoreside*

While some of the options and details of the mothership and shoreside co-op program vary, the general description of the program with respect to catcher vessels participating in the shoreside sector is exactly as described in the first two paragraphs in the above section on the mothership sector (except that endorsements would be for the shoreside whiting catcher vessels).

Under one version of the shoreside whiting co-op program there will be no constraints on participation by processors and no ties or delivery obligations between vessels and processors. Under the other version of the program, for the first two years only processors that have qualified for a shoreside processor permit will be eligible to receive fish from a co-op. Qualification will be based on having processed a specified amount of whiting during certain qualifying years. A permit that is in the non-co-op portion may deliver to any processor but a permit in a co-op will be required to deliver whiting to the co-op-qualified processors that were the basis of its catch history. If a permit wants to deliver to a processor different than the one(s) it is assigned to, it will have to enter the non-co-op portion of the fishery for a given number of years, after which it will be released from obligations and may deliver to any shoreside processor. There are two options for processor ties. Under one, after the first two years of a program, once a permit breaks its processor tie it can rejoin a co-op, deliver to any processor, and is not obligated to deliver to that same processor in subsequent years. Under the other option, the permit will be obligated to the processor(s) to which it chooses to deliver in its first year upon rejoining the co-op and in order to break that obligation must again return to the non-co-op fishery for a period of time.

Like in the IFQ alternative, accumulation limits will be imposed to prevent excessive concentration. These limits will cap the proportion of whiting an individual or entity could accumulate via ownership of catcher vessel permit(s).

2.5.1.4 *Co-ops for Catcher-Processors*

Under this alternative, the main change from the current CP sector management will be the creation of a CP endorsement to close the CP fishery to new entrants. This endorsement will be granted to limited entry permits registered to CP vessels if they meet specified qualification criteria. Only vessels with a CP limited entry permit will be allowed to harvest fish from the sector's allocation. Limited entry permits with CP endorsements will continue to be transferable.

Catch by the CP sector will be controlled primarily by closing the fishery when a constraining allocation is reached. As under status quo, co-op(s) may continue to be formed voluntarily by CP permit holders. If a co-op is formed, the sector will be managed as a private voluntary cooperative and governed by a private contract that will likely include division of the sector allocation among eligible vessels according to an agreed harvest schedule. NMFS will not establish an allocation of catch or catch history among permits. Therefore, if any permit holder decides not to join the cooperative, a race for fish could ensue. Similarly, if more than one co-op is formed, a race for fish could ensue absent an inter co-op agreement.

2.5.2 Detailed Specification of Program Features and Options

Table 2-5. Overview of the co-op alternative.

B.1	***Whiting Sector Management Under Co-ops***
B-1.1	Whiting Management
B-1.2	Annual Whiting Rollovers
B-1.3	Bycatch Species Management
B-1.4	At-sea Observers/Monitoring
B-1.5	Mandatory Data Collection
B-1.6	Adaptive Management
B-2	***Whiting Mothership Sector Co-op Program***
B-2.1	Participation in the Mothership Sector
B-2.2	Permits/Endorsement Qualification and Characteristics
B-2.3	Co-op Formation and Operation Rules
B-2.4	Processor Ties
B-2.5	NMFS Role
B-3	***Whiting Shoreside Sector Co-op Program***
B-3.1	Participation in the Shoreside Whiting Sector
B-3.2	Permits/Endorsement Qualification and Characteristics
B-3.3	Co-op Formation and Operation Rules
B-3.4	Processor Ties
B-3.5	NMFS Role
B-3.6	Exclude Processor Ties and Processor Licensing (Option)
B-4	***Co-ops for Catcher-Processors***
B-4.1	Participation in the Catcher-Processor Sector and Endorsement Qualification
B-4.2	Co-op Formation and Operation Rules
B-4.3	NMFS Role

B-1 Whiting Sector Management Under Co-ops

B-1.1 Whiting Management

Under the co-op options for the mothership and shoreside sectors, catcher vessel permits will be endorsed for deliveries to these sectors and amounts of history assigned.

The whiting catch history calculation for each mothership-endorsed catcher vessel permit [CV(MS)] and shoreside-endorsed catcher vessel permit [CV(MS)] will be assigned to a pool for the co-op in which the permit will participate or a pool for the mothership or shoreside non-co-op fishery. Co-ops are responsible for monitoring and enforcing the catch limits of co-op members. NMFS will monitor the catch in the non-co-op fishery, the co-op fisheries, and the overall catch of all three sectors. NMFS will close these fisheries when their catch limits have been achieved.

B-1.2 Annual Whiting Rollovers

Whiting Rollover Option 1: There will not be a rollover of unused whiting from one whiting sector to another.
Whiting Rollover Option 2: Each year rollovers to other sectors may occur if sector participants are surveyed by NMFS and no participants intend to harvest remaining sector allocations in that year. Current provisions for NMFS to re-allocate unused sector allocations of whiting (from sectors no longer active in the fishery) to other sectors still active in the fishery will be maintained (see 50CFR660.323(c) – Reapportionments).

B-1.3 Bycatch Species Management

For the foreseeable future, the whiting fishery will be managed under bycatch limits (hard caps) for widow, canary, and darkblotched rockfish. The ESA-listed salmon bycatch management measures—that is, the 11,000 Chinook threshold, 0.05 rate threshold, and triggered 100 fathom closure—will also continue to be in place. The goal of bycatch management is to control the rate and amounts of rockfish and salmon bycatch to ensure each sector is provided an opportunity to harvest its whiting allocation.

B-1.3.1 Bycatch Allocation Subdivision

- **Subdivision Option A** (No Subdivision): Do not subdivide bycatch species.
- **Subdivision Option B** (Subdivide by Sector): Subdivide bycatch species allocation among each of the whiting sectors (sector allocations will be determined in the intersector allocation process).
- **Subdivision Option C** (Subdivide by Sector and Co-op/Non-co-op Fisheries): Subdivide bycatch species allocation among each of the whiting sectors, and within the sectors subdivide between the co-op fishery and non-co-op fishery (subdivision for the non-co-op fishery does not apply to the catcher-processor co-op program).
- **Subdivision Option D** (Subdivide by Sector, Co-op/Non-co-op Fisheries, and Among Co-ops): Same as C, but in addition subdivide bycatch among the co-ops.

B-1.3.2 Bycatch Management

All sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species. For overfished stocks allocated to the whiting fishery, the Council may use the following tools for the co-op and non-co-op fisheries:
seasonal releases of allocations
area closures (seasonal or year round)

The seasonal releases and area closures may be the same or different for different species. Area closures may be year-round, seasonal, or triggered automatically by the attainment of certain levels of catch.[15]

[15] The Council asked for analysis of seasonal releases and area management at the sector, individual, and co-op levels (if here is an inter-co-op agreement).

For Subdivision Option A (No Bycatch Subdivision): If bycatch species are not allocated among the sectors, then:

Bycatch Management Option 1: Initially, the Council will not use seasonal releases and a controlled pace may be established if the sectors choose to work together cooperatively, potentially forming an inter-sector/inter-co-op cooperative.

Bycatch Management Option 2: There will be seasonal releases of bycatch allocation. At the outset, it is envisioned that the seasonal approach will be used to manage widow rockfish bycatch; for canary rockfish and darkblotched rockfish, status quo management will be maintained (i.e., no sector allocation and no seasonal apportionment).

A seasonal release bycatch management program will be implemented through regulation.[16]

In practice, seasonal releases protect the next sector entering the fishery. For example, a May 15-June 15 release will be used by the catcher-processors and motherships, but it protects the shoreside fishery; the June 15-September release will be used by shoreside and whatever catcher-processors and motherships are still fishing whiting, and to protect a fall at-sea season after September 15; the final release in September will again be shared by the catcher-processors and motherships, assuming shoreside is done fishing.

For example:

1. Status quo for canary and darkblotched rockfish; i.e., no seasonal or sector allocation.
2. May 1 -June 15: 40 percent of widow hard cap released.
3. June 15-August 31: An additional 45 percent of widow hard cap released.
4. September 1-December 31: Final 15 percent of widow hard cap released.
5. Once a seasonal release of widow rockfish is reached, the whiting fishery is closed to all three sectors for that period. The fishery re-opens to all three sectors upon release of the next seasonal release of widow rockfish.
6. Unused amounts from one seasonal release rollover into subsequent release periods.

   (Note: percentages are for illustration purposes only, actual release percentages will be developed through the Council process).

For Subdivision Option B, C, and D (Bycatch Subdivision Among Trawl Sectors):

- **Rollover Option 1**: If each sector has its own allocation of bycatch, unused bycatch may be rolled over from one sector to another if the sector's full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.
- **Rollover Option 2**: **Rollovers are not allowed.**

For Subdivision Option C, and D (Bycatch Subdivision Among the Co-op and Non-cop Fisheries):

A sector's bycatch allocation will be divided between the co-op and non-co-op fishery of the sector, in proportion to the whiting allocated to each fishery. The co-op fishery will close based on attainment of its allocation.

Option 1: For the non-co-op fishery there will be a bycatch buffer. When only the buffer remains, the fishery would close temporarily while a determination is made as to a possible re-opening. If the fishery is reopened it will close based on attainment of its allocation. The buffer amounts considered will be:

Sub-option i: 20 percent

[16] For reference, a similar program is used to manage halibut bycatch in NPFMC-managed flatfish and Pacific cod fisheries, see 50CFR679.21(d).

Sub-option ii: 10 percent
Sub-option iii: 5 percent
Option 2: For the non-co-op fishery there will not be a buffer. The fishery will close based on attainment of its allocation.

For Subdivision Option D (Bycatch Subdivision Among Co-ops):
Bycatch will be allocated to each co-op pro rata in proportion to its whiting allocation. Each co-op will cease fishing when its bycatch allocation is reached.

B-1.4 At-sea Observers/ Monitoring

Shoreside Whiting Fishery: Increase observer coverage to 100 percent to enforce catch accounting requirements.
At-sea Whiting Fishery: 100 percent observer coverage aboard mothership and catcher-processors will continue.

For some coverage, cameras may be used in place of observers (feasibility to be determined).

B-1.5 Mandatory Data Collection (Option)

- Mandatory submission of economic data for LE trawl industry (harvesters and processors).
- Voluntary submission of economic data for other sectors of the fishing industry.
- Include transaction value information in a centralized registry of ownership.

Formal monitoring of government costs.

Mandatory Provisions. The Pacific Fishery Management Council and the NMFS shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data, compliance with which will be mandatory for members of the west coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl rationalization program and continued through the life of the program. Cost, revenue, ownership, employment and other information will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the program, including achievement of goals and objectives associated with the rationalization program. These data may also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. The program will include targeted and random audits as necessary to verify and validate data submissions. *Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA.* Additional funding (as compared to status quo) will be needed to support the collection of these data. The data collected would include data needed to meet MSA requirements (including antirust).

The development of the program shall include a comprehensive discussion of the enforcement of such a program, including discussion of the type of enforcement actions that will be taken if inaccuracies are found in mandatory data submissions. The intent of this action will be to ensure that accurate data are collected without being overly burdensome to industry in the event of unintended errors.

Voluntary Provisions: A voluntary data collection program will be used to collect information needed to assess spillover impacts on non-trawl fisheries.

Central Registry: Information on transaction prices will be included in a central registry of whiting endorsed permit and processor permit owners. Such information will also be included for sales and lessees.

Government Costs: Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the rationalization program.

B-1.6 Adaptive Management (Option)

Annually, 10 percent of the available aggregate harvest pounds for the co-op program (including harvest potentially available both to co-ops and the non-co-op fisheries) will be set aside for use in an adaptive management program that could create incentives for developing gear efficiencies, for community development, or to compensate for unforeseen outcomes from implementing the trawl rationalization program. Examples of unforeseen outcomes include, but are not limited to, unexpected geographic shifts in the distribution of catch or landings, unexpected effects on certain segments of the industry (e.g. processors), or an unexpected barrier to new entry into the fishery.

Under sections pertaining to annual allocation to co-ops and the non-co-op fishery, add for each sector as appropriate: Annually, 10 percent of the mothership, shoreside, and catcher-processor sector's available aggregate harvest pounds will be set aside for use in an adaptive management program.

B-2 Whiting Mothership Sector Co-Op Program

Overview. Qualified permits will be endorsed for mothership (MS) co-op participation. Each year the holders of those permits will choose whether their vessels will fish in the co-op fishery, in which individual co-ops will direct harvest, or fish in a non-co-op fishery that will be managed by NMFS as an Olympic style fishery. The co-op will be obligated to deliver its fish to specific mothership processors based on the obligations of each permit in the co-op. Limited entry permits will be issued for motherships and required for a mothership to receive whiting from catcher vessels.

B-2.1 Participation in the Mothership Sector

a. Catcher Vessels

Vessels with CV(MS)-endorsed permits may participate in either the co-op or non-co-op portion of the mothership fishery. They will choose annually which fishery they will participate in for the coming year. Additionally, any groundfish limited entry trawl permitted vessels may participate in the co-op portion of the fishery if they join a co-op (as described in Section B-2.3.3).[17] No other catcher vessels may participate in the mothership fishery.

[17] When such permits participate in a co-op the co-op will not be allocated any additional fish based on participation by such a vessel.

b. Processors

Only motherships with a mothership limited entry permit may receive deliveries from catcher vessels participating in the co-op or non-co-op portions of the mothership sector whiting fishery. (Note: Motherships may acquire such permits by transfer, see Section B-2.2.2.)

c. Vessels Excluded[18]

Motherships also operating as a catcher-processor may not operate as a mothership:
Option 1: During a year in which it also participates as a catcher processor.
Option 2: During a month in which it also participates as a catcher-processor.
Option 3: At the same time it is participating as a catcher-processor.

B-2.2 Permits/Endorsement Qualification and Characteristics

B-2.2.1 Catcher Vessel Mothership Whiting Endorsement (CV(MS) Whiting Endorsement)

a. Endorsement Qualification and History Assignment

Permits with a qualifying history will be designated as CV(MS) permits through the addition of an endorsement to their limited entry groundfish permit. At the time of endorsement qualification, each permit will also be assigned a catch history that will determine the share of the mothership whiting allocation associated with that permit.

Qualifying for a CV(MS) Whiting Endorsement. A limited entry permit will qualify for a CV(MS) whiting endorsement if it has a total of more than 500 mt of whiting deliveries to motherships from:
Qualification Option 1: 1994 through 2003
Qualification Option 2: 1997 through 2003

Catch History Assignment (Identification of Endorsement Related Catch History). The following are options for the initial calculation to be used in determining NMFS distribution to co-op and non-co-op fishery pools. A CV(MS) whiting endorsement calculated catch history will be based on whiting history during the related permit's best 6 out of 7 years from 1997 through 2003. (Note: for vessels qualifying in both the shoreside and mothership co-op programs, the same year must be dropped.)

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

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18 A vessel that has been under foreign registry after the date of the American Fisheries Act (AFA) and that has participated in fisheries in the territorial waters or exclusive economic zones of other countries will not be eligible to participate as a mothership in the mothership sector of the Pacific whiting fishery, as per Section 12102(c)(6) of the AFA.

b. Whiting Endorsement Transferability and Endorsement Severability

Transfer Option 1: The CV(MS) whiting endorsement (together with the associated catch history) *may not be* severed from the groundfish limited entry trawl permit.
Transfer Option 2: The CV(MS) whiting endorsement (together with the associated catch history) *may be* severed from the groundfish limited entry trawl permit and transferred to a different limited entry trawl permit. Catch history associated with the whiting endorsement may not be subdivided.

c. Accumulation Limit

CV(MS) Permit Ownership: No individual or entity may own CV(MS) permits for which the allocation totals greater than 10, 15, or 25 percent of the total mothership sector whiting allocation.

d. Combination

CV(MS) Permit Combination to Achieve a Larger Size Endorsement. When a CV(MS)-endorsed permit is combined with another permit, the resulting permit will be CV(MS) endorsed, except when the CV(MS) permit is combined with a CP permit, in which case the CV(MS) endorsement will not survive on the resulting permit.[19]

B-2.2.2 Mothership Processor Permit

a. Qualifying Entities

Option 1: The owners of qualifying motherships will be issued MS permits. In the case of bareboat charters, the charterer of the bareboat will be issued the permit.
Option 2: The owners of qualifying motherships will be issued MS permits.

b. Qualification Requirements

A qualifying mothership is one which processed at least 1,000 mt of whiting in each of any two years from 1997 through 2003.

c. Transferability

1. MS permits will be transferable, and
2. MS permits may be transferred to a vessel of any size (there will be no size endorsements associated with the permit)

[19] Specifically, a CV(MS)-endorsed permit that is combined with a limited entry trawl permit that is not CV(MS) endorsed or one that is CV(Shoreside) [CV(SS)] endorsed will be reissued with the CV(MS) endorsement. If the other permit is CV(SS) endorsed, the CV(SS) endorsement will also be maintained on the resulting permit. However, CV(MS) and CV(SS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(MS) permit is combined with a CP permit, the CV(MS) endorsement and history will not be reissued on the combined permit. The size endorsement resulting from permit combinations will be determined based on the existing permit combination formula.

3. **Option 1**: MS permits **may not** be transferred to a vessel engaged in the *harvest* of whiting in the year of the transfer.
   Option 2: MS permits **may** be transferred to a vessel engaged in the *harvest* of whiting in the year of the transfer.
4. Limit on the Frequency of Transfers:
   Option 1: MS permits may not be transferred during the fishing year.
   Option 2: MS permits may only be transferred one time during the fishing year.
   Option 3: MS permits may be transferred two times during the fishing year.

d. Usage Limit

No individual or entity owning a MS permit(s) may process more than…
Option 1: 20 percent,
Option 2: 30 percent, or
Option 3: 50 percent
…of the total mothership sector whiting allocation.

B-2.3 Co-op Formation and Operation Rules.

B-2.3.1 Who and Number of Co-ops

Co-ops will be formed among CV(MS) permit owners.

Co-op Formation Option 1 (Multiple Co-ops): *Multiple co-ops would be organized around motherships*. Permit owners choosing to participate in the co-op fishery must form a separate co-op based on the mothership where the CV(MS) permit holders delivered the majority of their most recent year's catch.

Co-op Formation Option 2: Multiple co-ops are not required. Catcher vessels may organize a single co-op or multiple co-ops but are obligated to deliver to the processors as proscribed in B-2.4.

B-2.3.2 When

Each year at a date certain prior to the start of the fishery, MS and CV(MS) permit holders planning to participate in the mothership sector must register with NMFS. At that time CV(MS) permit holders must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery.

B-2.3.3 Co-op Agreement Standards

The following section has been modified based on guidance provided in Motion 27 at the November 2007 Council meeting. These modifications have not yet been reviewed by the NWR and NOAA GC and may be changes as a result of that review.

a. Submissions to NMFS and the Council

Co-op agreement. Co-op agreements will be submitted to NMFS for approval. Signed copies of the cooperative contracts must be filed with the Council and NMFS and available for public review before the co-op is authorized to engage in fishing activities. (**During council discussion this was flagged by NOAA General Counsel as a potential legal problem.**) Any material changes or amendments to the contract must be filed annual with the Council and NMFS by a date certain.

Letter to Department of Justice. Co-ops must also file with the Council and NMFS a copy of a letter from the co-op requesting a business review letter on the fishery cooperative from the Department of Justice and any response to such request.

b. Number of Participants in Each Co-op (Including Inter-co-ops)

Two or more permits may form a co-op for harvesters but participation must conform to the requirements of Section B-2.3.1. Co-ops may form co-ops with other co-ops. Within one of the whiting sectors, these co-ops may be formed to manage directed catch and/or bycatch.

c. Catch History Distributions Among Permits

Co-op agreements must stipulate that catch allocations to members of the co-op be based on their catch history calculation distribution to the co-op by NMFS.

d. Participation by Non-CV (MS) Endorsed Permits

Through temporary arrangements a co-op allocation may be harvested by any catcher vessel holding a valid limited entry trawl permit which has joined the co-op (including one that does not have a CV(MS) endorsement).[20]

e. Other Required Co-op Agreement Provisions

A co-op agreement must include:

1. A list of all vessels, and which must match the amount distributed to individual permit holders by NMFS
2. Signature of all permit holders participating in the co-op
3. A plan to adequately monitor catch and bycatch
4. Adequate enforcement and penalty provisions to ensure that catch and bycatch overages do not occur
5. Measures designed to reduce bycatch of overfished species
6. An obligation to manage inseason transfers of catch history
7. A requirement that agreement by at least a majority of the members is required to dissolve a co-op (**During council discussion this was flagged by NOAA General Counsel as a potential legal problem**)
8. An obligation to produce an annual report to the Council and NMFS by a date certain documenting the co-op's catch and bycatch data and inseason transfers (the report is to be available for review by the public)
9. Identification of a co-op manager who will:
   a. serve as the contact person with NMFS, the Council and other co-ops,
   b. be responsible for the annual distribution of catch and bycatch,
   c. oversee transfers,
   d. prepare annual reports, and
   e. be authorized to receive or respond to any legal process against the co-op.

[20] As a member of the co-op, such a vessel would be subject to Section B-2.4 and the indicated processor obligations.

10. Provisions that prohibit co-op membership by permit holders that have incurred legal sanctions that prevent them from fishing groundfish in the Pacific Fishery Management Council region
11. A provision that requires new owners to comply with membership restrictions in the co-op agreements

f. Additional Provisions for Inter-co-op Agreements

1. In the case of two or more cooperatives entering into an inter-cooperative agreement, the inter-co-op agreement must incorporate and honor the provisions of the individual co-op agreements unless all such agreements (or modifications thereof) are resubmitted for approval.
2. The requirements of Sections 2.3.3.a-2.3.3.e apply to the inter-co-op agreement, except that for the purpose of Section 2.3.3.e., subparagraph 7, the members of the inter-co-ops are the co-ops and not the participants in each co-op.

B-2.3.4 Annual Allocation Transferability

1. The annual allocations received by a co-op based on catch history of the whiting endorsements held by its members may be transferred among co-op members and from one co-op to another so long as obligations to processors are met (as per Section B-2.4). Additionally, in order to transfer annual allocation from one co-op to another there must be a NMFS approved inter-co-op agreement.
2. Allocations may not be transferred from the mothership sector to another sector.

B-2.4 Processor Ties

Permits will be obligated to deliver…

Option 1: all,
Option 2: 75 percent,
Option 3: 50 percent, or

…of their catch (the permits' "obligated deliveries") to certain motherships, as specified in the following sections. Catch that is not so obligated may be delivered to any mothership with an MS permit.

B-2.4.1 Formation and Modification of Processor Tie Obligations

In the first year of the program, the CV(MS) permit owner's choice will be between delivering in the non-co-op fishery and making deliveries as part of a co-op. If the permit chooses to participate in a co-op its obligated deliveries must go to the licensed mothership to which the permit delivered the majority of its whiting catch in:

Option 1: The most recent year that it fished before the program was implemented
Option 2: From 1997 through 2004
Option 3: From 1994 through 2003

If a mothership does not qualify for an MS permit in the first year of the program,[21] the vessels which delivered to that mothership in the previous year may deliver its obligated catch to the qualified mothership to which it last delivered its majority of catch. If none of the motherships to the which the

[21] If a mothership that does not qualify for a permit acquires such a permit (i.e., arranges for the transfer of a permit) by the time co-ops are established for the first year of the program, would it be the Council's intent that such the catcher vessel obligation to that mothership remain in place?

permit would be obligated qualify for an MS permit, the permit may participate in the co-op and deliver to a licensed mothership of its choosing. Alternatively, the permit may choose to participate in the non-co-op fishery.

Thereafter, each year, CV(MS) permit owners choosing to participate in a co-op will deliver their obligated catch to the same mothership to which they were obligated in the previous year. However, if the CV(MS) permit owners chose to participate in the non-co-op fishery in the previous year, or did not participate in the mothership whiting fishery, it is released from its obligation to a particular mothership and may deliver to any mothership with an MS permit.

Mothership Permit Transfer. If a mothership transfers its MS permit to a different mothership or different owner, the CV(MS) permit obligation remains in place and transfers with the MS permit to the replacement mothership unless the obligation is changed by mutual agreement or participation in the non-co-op fishery.

B-2.4.2 Flexibility in Meeting Processor Tie Obligations

a. Temporary Transfer of the Annual Allocation Within the Co-op or from One Co-op to Another

When CV(MS) permit owners transfer co-op allocations from one co-op member to another within the co-op or from one co-op to another within an inter-co-op, and the allocation that is transferred is part of the obligated deliveries, such allocations must be delivered to the mothership to which the allocation is obligated, unless released by mutual agreement.

b. Mutual Agreement Exception

By mutual agreement of the CV(MS) permit owner and mothership to which the permit is obligated, and on a year-to-year basis, a permit may deliver its obligated deliveries to a licensed mothership other than that to which it is obligated. Such an agreement will not change the permit's future-year obligation to the mothership (i.e., the permit will still need to participate in the non-co-op fishery for one year in order to move its obligated deliveries from one mothership to another).

B-2.4.3 Mothership Processor Withdrawal

Mothership Withdrawal. If a mothership does not participate in the fishery and does not transfer its permit to another mothership, or does not agree to transfer delivery to another mothership, the CV(MS) permit holders obligated to that mothership may join a different co-op and deliver their obligation to a different mothership; or the entire co-op which delivered to that mothership may deliver its obligated catch to a different mothership. The permits will not be required to participate in the non-co-op fishery in order to shift from one mothership to another.

Option 1: If the mothership returns within two years, any permit with an obligation to that mothership prior to its departure will have the obligation reinstated, unless the permit has participated for one year in the non-co-op fishery. After two years, the permit's obligation will become linked to the mothership to which it most recently delivered its obligated catch.

Option 2: The permit will become obligated to the mothership that it delivers its obligated catch to subsequent to the withdrawal of the mothership to which it was previously obligated.

B-2.5 NMFS Role

B-2.5.1 Permit and Endorsement Issuance

NMFS will issue all necessary permits and endorsements under the rules specified under this program. Appeals processes will be provided as appropriate and necessary.

B-2.5.2 Fishery Registration and Co-op Approval

NMFS will announce a deadline before which all co-op agreements must be received for the coming year. NMFS will review and approve or reject co-op agreements based on standards provided here and other standards that it deems necessary to achieve the policy intent of the Council's actions.

B-2.5.3 Annual Allocation to Co-ops and the Non-co-op Fishery

a. Co-op Allocation

Each year NMFS will determine the percent of the mothership sector's harvest allocation to be given to each co-op based on the catch history calculation of CV(MS) permits registered to participate in the co-op that year. NMFS does not allocate to the individual permit holder; rather, NMFS allocates an aggregate amount of harvest tonnage annually to the co-op based on the catch histories associated with the members of the co-ops.

b. Non-co-op Allocation

Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

c. Adaptive Management Allocation

In determining the amounts available for co-ops and the non-co-op fishery, subtractions will be made, as necessary for the adaptive management set aside described in Section B-1.6.

B-2.5.4 Fishery Management and Co-op Monitoring

1. NMFS will track all permit and endorsement transfers (if endorsement transfers are allowed) and the invocation of mutual agreement exceptions. Permit and endorsement transfers will not be valid until registered and acknowledged by NMFS.

2. NMFS will monitor catch and close segments of the fishery as necessary to ensure catch limits are not exceeded for:
   a. the whiting mothership co-op fishery
   b. the whiting mothership non-co-op fishery
   c. the mothership whiting sector as a whole
3. NMFS will not necessarily monitor, but will investigate and enforce as it deems necessary, the permit and co-op obligations to processors

4. NMFS will not necessarily monitor or enforce (except as it deems necessary):
   a. an individual permit's progress towards its catch allocations (permit level catch control will be at the co-op level and enforced through execution of the private contract)
   b. a co-op's progress toward its catch allocation[22]
   c. actual performance of the co-op agreement (the parties to the contract will resolve through private contract and remedies any deviation from provisions such as that requiring that a vessel have the opportunity to harvest the catch allocated to the co-op based on that vessel's permit, Section B-2.3.3.c)
5. NMFS will monitor other program provisions as needed. In some situations, there may need to be a declaration procedure to determine where a permit is delivering its obligated catch, for example, if a mothership withdraws without transferring its permit or reaching a mutual agreement for the transfer of obligated deliveries to a different mothership.
6. NMFS will administer the adaptive management program, allocating the set aside for that program as needed based on the adaptive management goals, objectives, and adjustment measures recommended by the Council.

B-3 Whiting Shoreside Sector Co-Op Program

Overview: Qualified permits will be endorsed for shoreside co-op participation. Each year the holders of those permits will choose whether their vessels will fish in the co-op fishery, in which case individual co-ops will direct harvest, or fish in a non-co-op fishery that will be managed by NMFS as an Olympic-style fishery. The co-op will be obligated to deliver its fish to specific processors based on the obligations of each permit in the co-op. For the first 2 years, only certain qualified processors will be eligible to receive deliveries from co-op vessels. Over time, these obligations may change or end (depending on options selected).

B-3.1 Participation in the Shoreside Whiting Sector

a. Catcher Vessels

Vessels with CV(SS)-endorsed permits may participate in either the co-op or non-co-op portion of the shoreside fishery. They will choose annually which portion of the fishery they will participate in for the coming year. Additionally, any groundfish limited entry trawl permitted vessels may participate in the co-op portion of the fishery if they join a co-op (as described in Section B-3.3.3).[23] No other catcher vessels may participate in the shoreside whiting sector.

b. Processors

Any processor may receive fish from vessels participating in the shoreside non-co-op fishery. In the first 2 years, only co-op qualified shoreside processors[24] that have declared their intent to participate

[22] This assumes that there is an inter-co-op agreement in place that covers the entire co-op fishery. If such an agreement is not in place covering both catch and bycatch, NMFS may need to monitor catch by each individual co-op (but not by the individual vessels in the co-op).

[23] When such permits participate in a co-op the co-op will not be allocated any additional fish based on participation by such a vessel.

[24] **A shoreside processor** is an operation, working on U.S. soil, that takes landings of trawl-caught groundfish that has not been processed at-sea or previously processed shoreside, and that thereafter subjects those

may receive deliveries from catcher vessels in a shoreside co-op (Section B-3.3). Thereafter, any shoreside processor may receive deliveries from co-ops.

c. Catcher Vessels and Processors in the Nonwhiting Fishery

This program does not affect vessels or processors receiving whiting taken incidentally in the nonwhiting fishery.

B-3.2 Permits/Endorsement Qualification and Characteristics

B-3.2.1 Catcher Vessel Shoreside Whiting Endorsement (CV(SS) Endorsement)

a. Endorsement Qualification and History Assignment

Permits with a qualifying history will be designated as CV(SS) permits through the addition of a CV(SS) endorsement to their limited entry groundfish permit. At the time of endorsement qualification, each permit will also be assigned a catch history that will determine the share of the shoreside whiting allocation associated with that permit.

Qualifying for a CV(SS) Endorsement. A limited entry permit will qualify for a CV(SS) endorsement if it has a total of more than 500 mt of whiting deliveries to shoreside processors from 1997 through 2003

Catch History Assignment. An initial calculation will be used to determine NMFS's distribution to co-op and non-co-op fishery pools. A CV(SS) permit calculated landings history will be based on whiting history during the related permit's best 6 out of 7 years from 1997 through 2003. (Note: for vessels qualifying in both the shoreside and mothership co-op programs, the same year must be dropped.)

For the purpose of the endorsement and initial calculation, landing history associated with the permit includes that of permits that were combined to generate the current permit.

b. Transferability and Endorsement Severability

Transfer Option 1: The CV(SS) endorsement (together with the associated catch history) may not be severed from the groundfish limited entry trawl permit.
Transfer Option 2: The CV(SS) endorsement (together with the associated catch history) may be severed from the groundfish limited entry trawl permit and transferred to a different limited entry trawl permit. Catch history associated with the whiting endorsement may not be subdivided.
Whiting harvest history (i.e., co-op shares) are not permanently separable from the CV(SS) endorsement.

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groundfish to shoreside processing. 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 the shoreside co-op program.
"Shoreside processing" is defined as any activity that takes place shoreside; and that involves:

a) cutting groundfish into smaller portions; or
b) freezing, cooking, smoking, drying groundfish; or
c) packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.

c. Accumulation Limits

CV(SS) Permit Ownership. No individual or entity may own CV(SS) permits for which the allocation totals greater than 15 percent of the total whiting shoreside allocation.

d. Combination

CV(SS) Permit Combination to Achieve a Larger Size Endorsement. When a CV(SS)-endorsed permit is combined with another permit, the resulting permit will be CV(SS) endorsed, except when the CV(SS) permit is combined with a CP permit, in which case the CV(SS) endorsement will not survive on the resulting permit.[25]

B-3.2.2 Shoreside Co-op Eligible Processor Permit

a. Activities Requiring this Permit

Only processing entities with a shoreside co-op processor permit (SSP) are eligible to receive whiting fish from whiting cooperatives in the first 2 years of the program. Thereafter, any processing corporation could be eligible to receive whiting from participants in a whiting cooperative, subject to the other provisions of this plan. Processors without SSPs may receive whiting from participants in the non-co-op fishery and whiting harvested incidentally in the nonwhiting fishery at any time, including within the first 2 years of the program.

b. Qualification Requirements

An initial co-op-qualified shoreside processing entity is one that processed at least 1,000 mt of whiting in each of any two years from 1998 through 2003.

c. Transferability

SSP permits will be transferable. If a shoreside processor transfers its SSP permit to a different shoreside processor or different owner, the CV(SS) permit's obligation remains in place unless changed by mutual agreement (as per Section 3.4.3.b) or participation in the non-co-op fishery, (as per Section 3.4.2).

d. Duration of this Section

Since SSP permits are only in effect for the first 2 years of the program, this section is also in effect only for the first 2 years of the program.

[25] Specifically, a CV(SS)-endorsed permit that is combined with a limited entry trawl permit that is not CV(SS) endorsed or one that is CV(MS) endorsed will be reissued with the CV(SS) endorsement. If the other permit is CV(MS) endorsed, the CV(MS) endorsement will also be maintained on the resulting permit. However, CV(SS) and CV(MS) histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the histories were originally determined. If a CV(SS) permit is combined with a CP permit, the CV(SS) endorsement and history will not be reissued on the combined permit. The size endorsement resulting from permit combinations will be determined based on the existing permit combination formula.

B-3.3 Co-op Formation and Operation Rules

B-3.3.1 Who

Co-ops will be formed among CV(SS) permit owners. Multiple co-ops may be formed and new co-ops may be formed each year, prior to annual registration. Owners of LE trawl permits that are not CV(SS) endorsed may join a co-op, but their participation in the co-op will not add to the co-op's allocation. Vessels fishing in the non-co-op fishery may not form co-ops to coordinate harvest in the non-co-op fishery. [26]

B-3.3.2 When

Each year CV(SS) permit holders planning to participate in the shoreside sector must register with NMFS and express their intent to be a member of the co-op at a date certain prior to the start of the fishery. At that time CV(SS) permit holders must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery.

B-3.3.3 Co-op Agreement Standards

The following section has been modified based on guidance provided in Motion 27 at the November 2007 Council meeting. These modifications have not yet been reviewed by the NWR and NOAA GC and may be changes as a result of that review.

a. Submissions to NMFS and the Council

Co-op agreement. Co-op agreements will be submitted to NMFS for approval. Signed copies of the cooperative contracts must be filed with the Council and NMFS and available for public review before the co-op is authorized to engage in fishing activities. (**During council discussion this was flagged by NOAA General Counsel as a potential legal problem.**) Any material changes or amendments to the contract must be filed annually with the Council and NMFS by a date certain.

Letter to Department of Justice. Co-ops must also file with the Council and NMFS a copy of a letter from the co-op requesting a business review letter on the fishery cooperative from the Department of Justice and any response to such request.

b. Number of Participants in Each Co-op (Including Inter-co-ops)

Two or more permits may form a co-op for harvesters but participation must conform to the requirements of Section B-3.3.1. Co-ops may form co-ops with other co-ops (inter-co-op). Within one of the whiting sectors, these co-ops may be formed to manage directed catch and/or bycatch.

[26] This provision does not cover cooperative behavior that is not governed by formally memorialized covenants (written contracts).

c. Catch History Distributions among Permits

Co-op agreements must stipulate that catch allocations to members of the co-op be based on their catch history calculation distribution to the co-op by NMFS.

d. Participation by Non-CV(SS) Endorsed Permits

Through temporary arrangements a co-op allocation may be harvested by any catcher vessel holding a valid limited entry trawl permit which has joined the co-op (including one that does not have a CV(SS) endorsement).[27]

e. Other Required Co-op Agreement Provisions

A co-op agreement must include:

1. A list of all vessels and permit holders participating in the coop and their share of allocated catch, which must match the amount distributed to individual permit holders by NMFS,
2. Signature of all permit holder participating in the co-op
3. A plan to adequately monitor catch and bycatch
4. Adequate enforcement and penalty provisions to ensure that catch and bycatch overages do not occur
5. Measures designed to reduce bycatch of overfished species
6. An obligation to manage inseason transfers of catch history
7. A requirement that agreement by at least a majority of the members is required to dissolve a co-op, (**During council discussion this was flagged by NOAA General Counsel as a potential legal problem**)
8. An obligation to produce an annual report to the Council and NMFS by a date certain documenting the co-op's catch and bycatch data and inseason transfers (the report is to be available for review by the public)
9. Identification of a co-op manager who will:
   a. serve as the contact person with NMFS, the Council and other co-ops,
   b. be responsible for the annual distribution of catch and bycatch,
   c. oversee transfers,
   d. prepare annual reports, and
   e. be authorized to receive or respond to any legal process against the co-op.
10. Provisions that prohibit co-op membership by permit holders that have incurred legal sanctions that prevent them from fishing groundfish in the Pacific Fishery Management Council region
11. A provision that requires new owners to comply with membership restrictions in the co-op agreements

f. Additional Provisions for Inter-co-op Agreements

1. In the case of two or more cooperatives entering into an inter-cooperative agreement, the inter-co-op agreement must incorporate and honor the provisions of the individual co-op agreements unless all such agreements (or modifications thereof) are resubmitted for approval.
2. The requirements of Section 3.3.3.a through 3.3.3.e apply to the inter-co-op agreement, except that for the purpose of Section 3.3.3.e, subparagraph 7, the members of the inter-co-ops are the co-ops and not the participants in each co-op.

[27] As a member of the co-op, such a vessel would be subject to paragraph B-3.4 and the indicated processor obligations.

B-3.3.4 Annual Allocation Transferability

a. Temporary Transfer of Quota Shares within the Co-op

Temporary transfers of harvest allocation may take place within the co-op between permit holders.[28] Temporary transfers may also be made from one co-op to another so long as both co-ops are part of an inter-co-op agreement. Such inter- or intra-co-op transfers must deliver co-op allocation (shares) to the shoreside processor to which the shares are obligated unless released by mutual agreement (see Section B-3.4).

b. Transfer of Shares from the Shoreside Sector

Transfers of shares from the shoreside sector to other sectors in any form are prohibited.

B-3.4 Processor Ties

B-3.4.1 Initial Formation of Ties

During the first 2 years of co-op formation, permit owners that join a co-op shall be required to deliver their whiting catches to the co-op qualified processors that were the basis of their landing history during the period…
Years Option 1: **2001**
Years Option 2: **2000**
Years Option 3: **2000-2003**
…on a pro rata basis. Determination of the processor(s) to which a permit owner is obligated will take into account any of the processor's(s') successors in interest.

Processor Successor In Interest. In determining the processor to whom a permit owner that participates in a co-op is required to deliver in the first 2 years of the program, a processor's successor in interest will be taken into account. If a processor's assets were purchased and the landing history expressly identified as an asset in the purchase agreement, then any permit owner obligation based on those landings will accrue to the processor making the purchase. For landings history associated with a defunct or non-qualifying processor, that portion of a permit's allocation will be linked to the permit's initially-assigned landing history on a pro rata basis.

B-3.4.2 Duration and Modification of Processor Ties (Options 1 and 2)

A permit's obligation to a processor will remain in place from 1 year to the next unless modified through the following process.

Option 1: Once a CV(SS) permit has participated in the non-co-op fishery for [***Options: 1 to 5 consecutive years***], it is released from its delivery obligations to the processor(s) that were the basis of its history, and may join any of the various co-ops, or join with other permit holders who have also been released from delivery obligations to form a new co-op, and deliver to any shoreside processor in the subsequent years after the SSPs have expired.

[28] Such transfers may be used to allow a permit holder to make deliveries exclusively to one processor.

Option 2: Any CV(SS) permit participating in a co-op is linked indefinitely to the processor they are delivering to under the initial linkage requirements. The permit can sever that linkage by participating in the non-co-op fishery for a period of [***Options: 1 to 5 years***] years. After completing their non-co-op obligation, the permit is then free to reenter the co-op system and deliver to a processor of their choosing. Once the permit reenters the co-op system and elects to deliver their fish to a processor, a new linkage is then established with that processor. Should the permit later choose to break that new linkage, the non-co-op participation requirements again apply.

Should a permit elect to enter the non-co-op fishery within the first 2 years of this program, that permit must participate in the non-co-op fishery for a minimum of [***Options: 2 to 5 years***], regardless of other non-co-op participation requirements applying elsewhere in this document. Once the permit meets that obligation and later elects to enter a co-op, all provisions of co-op participation, including the processor linkage provisions, apply.

B-3.4.3 Flexibility in Meeting Processor Tie Obligations

a. Temporary Transfer of the Annual Allocation within the Co-op or from One Co-op to Another

When a co-op or inter-co-op transfers catch among its members it must ensure that the total co-op allocation received by the co-op, based on the permit holders that are members thereof, is distributed between the various co-op qualified processors on a pro rata basis, based on the landing history of the members of the co-op during the initial formation period specified in Section B-3.4.1 or the ties established through subsequent obligations, as per Section B-3.4.2.

b. Mutual Agreement Exception

By mutual agreement of the CV(SS) permit owner and shoreside processor to which the permit's catch is obligated, the vessel with the CV(SS)-endorsed permit may deliver to a shoreside processor other than that to which it is obligated. The transfer may be temporary or permanent. In either case the vessel's catch taken under that permit will continue to be obligated to the same processor (which, in future years, is the transferring processor if the transfer is temporary or the processor receiving the transfer if the transfer is permanent) subject to the terms of the transfer agreement. To make an additional change from its processor link (a change that is not by mutual agreement) the permit will need to be used in the non-co-op fishery for the prescribed time (as per Section B-3.4.2).

B-3.4.4 Shoreside Processor Annual Declaration and Withdrawal

1. Each year SSP permit holders planning to participate in the shoreside sector must register with NMFS.
2. If a qualified shoreside processor does not participate in the whiting fishery in any year in which the co-op fishery is in operation, the CV(SS) permit holders that will otherwise be obligated to deliver to that shoreside processor shall be free to deliver to any other shoreside processor that year.

B-3.5 NMFS Role

B-3.5.1 Permit and Endorsement Issuance

NMFS will issue all necessary permits and endorsements under the rules specified under this program. Appeals processes will be provided as appropriate and necessary.

B-3.5.2 Fishery Registration and Co-op Approval

1. NMFS will announce a date certain before which all co-op agreements must be received for the coming year. NMFS will review and approve or reject co-op agreements based on standards provided here and other standards that it deems necessary to achieve the policy intent of the Council’s actions.
2. For the first 2 years of the program NMFS will announce a date certain before which processors with SSPs must declare their intent to participate in the fishery.

B-3.5.3 Annual Allocation

a. Co-op Allocation

Each year NMFS will determine the distribution to be given to each co-op based on the landing history calculation of CV(SS) permits registered to participate in the co-op that year. In addition, NMFS will determine the landing history linking each co-op to each processor, if any.

b. Non-co-op Allocation

Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the landing history calculation of permit holders registered to participate in that fishery. The whiting allocation for the non-co-op segment shall be in proportion to the permit history of non-co-op participants, relative to the co-op participants. That allocation shall be available to all CV(SS)-endorsed permit holders who have registered to participate in the non-co-op fishery that year.

c. Adaptive Management Allocation

In determining the amounts available for co-ops and the non-co-op fishery, subtractions will be made, as necessary, for the adaptive management set aside described in Section B-1.6.

B-3.5.4 Fishery and Co-op Monitoring

1. NMFS will track all permit and endorsement transfers (if endorsement transfers are allowed) and the invocation of mutual agreement exceptions. Permit and endorsement transfers will not be valid until registered and acknowledged by NMFS.
2. NMFS will monitor catch and close segments of the fishery as necessary to ensure catch limits are not exceeded for:
   a. individual co-ops[29]

[29] If a co-op of co-ops (inter-co-op) is formed, NMFS will only monitor catch at the highest co-op level that meets the co-op agreement standards. If an inter-co-op covers the entire shoreside sector’s whiting harvest

   b. the whiting shoreside co-op fishery
   c. the whiting shoreside non-co-op fishery
   d. the shoreside whiting sector as a whole
3. NMFS will not necessarily monitor, but will investigate and enforce as it deems necessary, the permit and co-op obligations to processors
4. NMFS will not necessarily monitor or enforce (except as it deems necessary):
   a. an individual permit's progress towards its catch allocations (permit level catch control will be at the co-op level and enforced through execution of the private contract)
   b. actual performance of the co-op agreement (the parties to the contract will resolve through private contract and remedies any deviation from provisions such as that requiring that a vessel have the opportunity to harvest the catch allocated to the co-op based on that vessel's permit, Section B-2.3.3.c)
5. NMFS will monitor other program provisions as needed.
6. NMFS will administer the adaptive management program, allocating the set aside for that program as needed based on the adaptive management goals, objectives, and adjustment measures recommended by the Council.

B-3.6 Exclude Processor Ties and Processor Licensing (Option)

Option: Exclude from the above all references to processor ties and processor licensing.

This option includes the following changes to Section B-3:

Section B-3.1.b, Processors: Delete "non-co-op" from the first sentence and delete the remainder of the section. This section constrains processor participation in the first 2 years of the program.

Section B-3.2.2, Shoreside Co-op Eligible Processing Permit: Delete the entire section.

Section B-3.3.4, Annual Allocation Transferability. Delete the last sentence (refers to the handling of permit obligations to processors when allocations are transferred).

Section B-3.4, Processor Ties: Delete the entire section.

Section B-3.5.2.b: Delete the entire paragraph (addresses preseason registration of processors with shoreside processing permits)

Section B-3.5.3.a: Delete the last sentence (refers to the NMFS need to make determinations on permit links to processors)

Section B-3.5.3.c: Delete "and co-op obligations to processors."

B-4 Co-ops for Catcher-Processors

Catch by the catcher-processor sector will be controlled primarily by closing the fishery when a constraining allocation is reached. As under status quo, vessels may form co-ops to achieve benefits that result from a slower-paced, more controlled harvest. The main change from status quo is the creation of a limited number of catcher-processor endorsements. A new entrant will have to acquire a permit with a catcher processor endorsement in order to enter the fishery.

B-4.1 Participation in the Catcher-Processor Sector and Endorsement Qualification.

Catcher-processor (CP) Endorsement. The class of CP endorsed permits (CP permits) will be limited by an endorsement placed on a limited entry permit. Limited entry permits registered to qualified

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then NMFS will monitor the sector as a whole.

catcher-processor vessels will be endorsed as CP permits. A qualified permit is one that harvested and processed in the catcher-processor sector of the Pacific whiting fishery at any time from 1997 through 2003. Only vessels catcher-processor vessels with a CP endorsed limited entry permit will be allowed to process whiting at sea. Limited entry permits with CP endorsements will continue to be transferable.

CP Permit Combination to Achieve a Larger Size Endorsement. A CP permit that is combined with a limited entry trawl permit that is not CP endorsed will result in a single CP permit with a larger size endorsement. (A CV(MS) or CV(SS) endorsement on one of the permits being combined will not be reissued on the resulting permit.) The resulting size endorsement will be determined based on the existing permit combination formula.

B-4.2 Co-op Formation and Operation Rules

No annual registrations or declarations are required. As under status quo, co-op(s) will be formed among holders of permits for catcher-processors. Participation in the co-op will be at the discretion of those permit holders. If eligible participants choose to form a co-op, the catcher-processor sector will be managed as a private voluntary cooperative and governed by a private contract that specifies, inter alia, allocation of whiting among CP permits, catch/bycatch management, and enforcement and compliance provisions. Since NMFS will not establish an allocation of catch or catch history among permits, if any permit holder decides not to participate, the potential co-op benefits will diminish and a race for fish is likely to ensue. Similarly, if more than one co-op forms, a race for fish could likely ensue, absent an inter co-op agreement.

Annual Reporting Requirements. The CP cooperative will submit an annual report to the Pacific Fishery Management Council at their November meeting. The report will contain information about the current year's CP fishery, including the CP sector's annual allocation of Pacific whiting; the CP cooperative's actual retained and discarded catch of Pacific whiting, salmon, rockfish, groundfish, and other species on a vessel-by-vessel basis; a description of the method used by the CP cooperative to monitor performance of cooperative vessels that participated in the CP sector of the fishery; and a description of any actions taken by the CP cooperative in response to any vessels that exceed their allowed catch and bycatch. The report will also identify plans for the next year's CP fishery, including the companies participating in the cooperative, the harvest agreement, and catch monitoring and reporting requirements.

B-4.3 NMFS Role

B-4.3.1 Permit and Endorsement Issuance

NMFS will issue all necessary endorsements under the rules specified under this program. Appeals processes will be provided as appropriate and necessary.

B-4.3.2 Annual Allocation

There will be no government-directed subdivision of the catcher-processor sector quota among participants. However, up to 10 percent of the allocation to the catcher-processor may be set aside as necessary for the adaptive management set aside described in Section B-1.6.

The catcher-processor sector allocation may be divided among eligible catcher-processor vessels (i.e., those catcher-processor vessels for which a CP permit is held) according to an agreed catcher-processor cooperative harvest schedule as specified by private contract.

B-4.3.3 Fishery and Co-op Monitoring

1. NMFS will track all permit transfers. Permit transfers will not be valid until registered and acknowledged by NMFS.
2. NMFS will monitor catch and close the catcher-processor sector fishery as necessary to ensure catch limits are not exceeded.
3. NMFS will administer the adaptive management program, allocating the set aside for that program as needed based on the adaptive management goals, objectives, and adjustment measures recommended by the Council.

2.6 Council-preferred Alternative

To be completed after Council action.

CHAPTER 6 CONSISTENCY WITH THE IFQ PROGRAM, WEST COAST GROUNDFISH FMP, AND MSA NATIONAL STANDARDS AND REQUIREMENTS

Limited access privilege program related guidelines, requirements, goals, objectives and constraints summarized from the MSA, the groundfish FMP, and this plan amendment are summarized in Table 6-1.

Table 6-1. Policy guidance from MSA, Groundfish FMP and Amendment 20 goals and Objectives

Guidance	Reference
Conservation	
Allocations Reasonably Calculated to **Promote Conservation**	MSA - National Standard 4(b)
LAPPs shall **assist in rebuilding** overfished species	MSA – 303A(c)(1)(A)
LAPPs shall **promote fishery conservation** and management	MSA – 303A(c)(1)(C)(ii)
Maintain an **information flow** on the status of the fishery… as the fishery occurs	GF FMP Objective 1
Reduce **nongroundfish mortality**	GF FMP Objective 4
Minimize adverse impacts on **EFH**	GF FMP – Objective 5
Total catch accounting; Reduce bycatch, discard mortality, and ecological impacts	A-20 Objective 1 & 3
Consider biological stock structure, not exceeding the OY/ABC, minimizing localized concentrations of fishing effort, and accounting for total mortality	A-20 Constraints 1, 2, 3, & 4
Net Benefits and Efficiency	
Consider Efficiency	MSA - National Standard 5
Contribute to **reducing capacity**	MSA - 303A(c)(1)(B)
Attempt to achieve the greatest net economic **benefit to the nation**	GF FMP Objective 6
Maximize the value of the groundfish resource as a whole	GF FMP Goal 2
Provide for a[n] . . . efficient groundfish fishery	A-20 Objective 2
Promote measurable economic benefits	A-20 Objective 6
Disruption	
Accomplish change with the least disruption of current domestic fishing practices, marketing procedures, and the environment	GF FMP Objective 14
Excessive Shares	
No particular individual, corporation, or other entity [shall] acquire an **excessive share** of privileges	MSA - National Standard 4(c)
Address concerns over **excessive geographic or other consolidation** in the harvesting or processing sectors of the fishery	MSA – 303A(c)(5)(B)(ii)
Ensure that LAPP holders do not acquire an excessive share by (i) establishing a **maximum share** to hold, acquire or use, and (ii) establishing other measures to prevent inequitable concentration	MSA – 303A(c)(5)(D)
Avoid excessive quota concentration	A-20 Constraint 6
Establish a review process to determine whether any illegal antitrust acts have occurred.	MSA – 303A(c)(1)(J)
Fairness and Equity	
The excessive share objectives also relate to fairness and equity considerations.	
Allocation shall be fair and equitable to all such fishermen	MSA - National Standard 4(a)
Establish procedures to ensure **fair and equitable** initial allocations, including consideration of (i) **current and historical** harvests; (ii) **employment** in the harvesting and processing sectors; (iii) **investments** in, and dependence upon, the fishery; and (iv) the **current and historical participation** of fishing communities;	MSA – 303A(c)(5)(A)
Issue privileges to persons who **substantially participate** in the fishery (as specified by the Council)	MSA – 303A(c)(5)(E)
Provide an administrative **appeals process** regarding initial allocation decisions	MSA – 303A(c)(1)(I)
Avoid provisions where the primary intent is a **change in marketing power balance** between harvesting and processing sectors	A-20 Constraint 5
Sector Health	
Provide for a **viable, profitable** . . . groundfish fishery	A-20 Objective 2
Promote **measurable economic . . . benefits** through the seafood catching, processing, distribution elements, and support sectors of the industry	A-20 Objective 6
Maximize the value of the groundfish resource as a whole	GF FMP Goal 2
Promote **year-round marketing opportunities** and extend those opportunities as long as practicable during the fishing year	GF FMP Objective 7
Avoid unnecessary **adverse impacts on small entities**	GF FMP Objective 15

Guidance	Reference
Labor: Captains, Crew, & Processing Plant Workers	
Include measures to **assist… entry-level and small vessel owner-operators, captains, crew… through set-asides** of allocations… or economic assistance in the purchase of quota	MSA – 303A(c)(5)(C)
Promote measurable… **employment benefits** through the seafood catching, processing, distribution elements, and support sectors of the industry	A-20 Objective 6
Promote the **safety of human life at sea**	MSA - National Standard10 GF FMP – Objective 17
Communities	
Consider importance of fishing to communities in order to provide sustained participation and to **minimize adverse impacts**	MSA - National Standard 8 GF FMP Objective 16 A-20 Objective 5
Consider basic cultural and social framework of the fishery through (i) the development of **policies to promote sustained participation** of… fishing communities that depend on the fisheries, including regional or port-specific landing and delivery requirement; (ii) procedures to **address concerns over excessive geographic** or other **consolidation** in the harvesting or processing sectors of the fishery	MSA – 303A(c)(5)(B)
Include measures to **assist**, when necessary and appropriate… fishing communities through **set-asides of harvesting allocations**… or economic assistance in the purchase of quota	MSA – 303A(c)(5)(C)
If a program is created in which fishing communities are given a special standing (e.g. a direct allocation to qualified fishign communities), the Council is required to consider the following criteria: (i) Traditional fishing or processing practices in, and dependency on, the fishery; (ii) The cultural and social framework relevant to the fishery; (iii) Economic barriers to access the fishery; (iv) Existence and severity of projected economic and social impacts associated with implementation…; (v) Expected effectiveness, transparency and equitability; and (vi) Potential for improving economic conditions in remote coastal communities…	MSA – 303A(c)(3)(B)
Minimize negative impacts resulting from **localized concentrations** of fishing effort (this constraint is also listed under "Conservation")	A-20 Constraint 3
Small Vessels, Small Entities, and New Entrants	
Promote sustained participation of small owner-operated fishing vessels	MSA – 303A(c)(5)(B)(i)
Include measures to **assist**, when necessary and appropriate, entry level and small vessel owner-operators . . . through **set-asides of harvesting allocations**… or economic assistance in the purchase of quota [1]	MSA – 303A(c)(5)(C)
Avoid unnecessary **adverse impacts** on small entities	GF FMP Objective 15
Auctions and Cost Recovery	
Auctions, or other **systems to collect royalties**, shall be considered for initial or any subsequent allocation	MSA – 303A(d)
Assess and provide a program of **fees paid by the quota holders** that will cover the costs of management, data collection and analysis, and enforcement activities	MSA – 303A(e)
Program Performance Monitoring and Modification	
Take into account the **management and administrative costs** of implementing and overseeing the IFQ or co-op program and complementary catch monitoring programs, and the limited state and federal resources available.	A-20 Constraint 9
Regular **review and monitoring of the program** for progress in meeting the goals, 5 year formal review	MSA – 303A(c)(1)(G)
Privileges may be revoked, limited or modified at anytime. Provide for revocation	MSA – 303A(b)(2) MSA – 303A(c)(1)(K)

[1] An **Assisted Purchase Program** may be developed to aid in financing quota purchase by small vessel fishermen and first time purchase by entry-level fishermen (MSA – 303A(g)(1)).

Agenda Item F.6.a
Attachment 1
June 2008

TRAWL RATIONALIZATION DECISION POINTS

The following table lists the central decisions needed to develop a preferred alternative, along with the GAC recommendations on the issue

Table 1. Central decision points (issues) and GAC recommendations by sector (grey indicates the issue does not apply to the sector, N/A indicates that based on decisions made further up in the table, no GAC recommendation on the topic was needed on that issue).

Issue	Sector			
	Catcher Processor	Mothership	Shoreside Whiting	Shoreside Nonwhiting
	GAC Recommendation			
IFQs or Co-ps?	Co-ops	Co-ops	IFQs	IFQs
Should the shoreside sector be managed as a single sector or separately?			Single Sector	
If IFQS: Should an initial allocation of QS be given to processors?	N/A	N/A	No	No
If processors receive an initial allocation Should the QS given to processor expire after a set period (limited duration QS)?		N/A	N/A	N/A
Should processing history allow an entity to receive an initial allocation in excess of accumulation limits (i.e. should the accumulation limit grandfather clause apply for QS issued to processors)?		N/A	N/A	N/A
If Co-ops: Should there be processor linkages.		Yes	N/A	N/A
Adaptive Management: Should adaptive management be part of the trawl rationalization program?	Yes	Yes	Yes	Yes
Should the primary tool (Co-ops or IFQs) be used for all species?	TIQC and GMT comment requested.			
If IFQs: Initial Allocation Formula				
Should the initial allocation formula include an equal sharing element?	N/A	N/A	Yes	
Should allocation of bycatch species be based on history or bycatch rates applied to QS allocations using permit specific logbook information?	N/A	N/A	Use Bycatch Rates	
Accumulation Limits	N/A	N/A	TIQC comment requested	
Area Management	N/A	N/A	TIQC & GMT comment requested.	

Table 2. IFQ Alternative, decision points and GAC/TIQC recommendations. (N/A = not applicable based on other decisions made. N/D = not discussed)

Topic	Sections	IFQ Alternative Decision Points	GAC	TIQC
Scope for IFQ Management	A-1.1	**Species covered.** Analysis has revealed that several species of nearshore groundfish and flatfish in the whiting sector may be as constraining to fishing opportunities as overfished stocks if managed with IFQ. Some believe consideration should be given for managing these stocks with a different management tool (such as retaining cumulative limits) or managing them passively (monitor catch levels, but do not control their catch with quota). See **Section 4.7.2.3** for analysis of this issue.	Tasked TIQC and GMT	Recom-mended List. See Report.
IFQ Management Units	A-1.2	Whether to split at 40° 10' or not (for species without geographic splits) Consider utility of specifying a process for subdividing the trawl allocation where there is no subdivision.	Tasked TIQC and GMT	Tasked TIQC and GMT
Trawl Sectors	A-1.3	3 (combined shoreside) or 4 sectors?	**3 Sectors**	**3 Sectors**
Length Endorsement	A-1.6	Whether to suspend the limited entry permit length endorsement.	**N/D**	**Suspend**
Initial Allocation				
Groups and Percent	A-2.1.1.a	Groups to include (processors or not) and % of QS for each group.	**None for Proces-sors**	**N/D**
	A-2.1.1.d	Motherships: allocate to mothership owner or charterer?	**N/A**	**N/D**
	A-2.1.1.d	Shoreside processor: attribution of catch history (first receiver, first receiver that also processes, first receiver with opportunity to reassign if the first receiver did not process).	**N/A**	**N/D**
Recent Participation	A-2.1.2.c	Shoreside processor recent participation options.	**N/A**	**N/D**
Allocation Formula	A-2.1.3.a	Catcher-Vessel Permits: Whether to include an equal allocation element and whether to use different allocation rules for overfished species.	**Yes**	**N/D**
	A-2.1.3.b, c and d	Catcher Processors, Motherships and Shoreside Processors: Whether to use different allocation rules for overfished species.	**N/A**	**N/D**

Table 2. IFQ Alternative, decision points and GAC/TIQC recommendations. (N/A = not applicable based on other decisions made. N/D = not discussed)				
Topic	**Sections**	**IFQ Alternative Decision Points**	**GAC**	**TIQC**
Permit/IFQ Holding Requirement	A-2.2.1	The scope of the fishing prohibitions for vessels with a deficit (set).	**N/D**	
	A-2.2.1	Whether to allow vessels with deficit to resume fishing after two years.		**Consider Appeals Process**
		In consideration of the issue of fisheries affected by the tie-up provision questions came up about the status of California halibut trawl gear • California halibut trawl is legal groundfish trawl gear • Vessels with a limited entry permit using the gear are allowed to discard groundfish and not come under groundfish regs. If they retain catch, groundfish regulations apply and the catch counts against their bimonthly limit. Vessels without limited entry permits are allowed to use the trawl gear and retain groundfish as long as they stay within open access limits.	**N/D**	**Discussed.** **No recom-mendation**
Carry-over (Surplus or Deficit)	A-2.2.2.e	Currently the provision to allow the carryover of a QP surplus only applies to pounds that are in a vessel's account. Should consideration be given to allowing a carryover for QP that have not been transferred to a vessel account?	**N/D**	**Discussed** **No recom-mendation**
Transfer Rules	A-2.2.3.c	Whether to prohibit QS transfers in the first year of the program.	**N/D**	**Yes**

Table 2. IFQ Alternative, decision points and GAC/TIQC recommendations. (N/A = not applicable based on other decisions made. N/D = not discussed)				
Topic	**Sections**	**IFQ Alternative Decision Points**	**GAC**	**TIQC**
	A-2.2.3.e	Accumulation limit levels (set).		**Discussed** **No recom-mendation**
	A-2.2.3.e	Decide the degree to which a grandfather clause for QS received as part of the initial distribution should be applied (none, maximum of twice the accumulation limits, no limit). Aggregate Nonwhiting Groundfish QS Accumulation Limit. This limit will be evaluated by weighting the non-whiting groundfish QS by the amount of the trawl allocation. What happens when a vessel is inside the aggregate limit but is pushed above when the trawl allocation increase (possibly through an OY increase). Analysts have been thinking they would be grandfathered in but, if so, this provision needs to be added. Matching the shoreside whiting accumulation cap with the nongroundfish species accumulation caps if there is a single shoreside sector. How will the grandfather amount be determined for vessels? Vessels do not receive a QS allocation, will the vessel grandfather amount be based on the permit? Will there be another vessel permit/medallion that specifies the grandfather amount? If so, will it be transferable? How would it expire? (The control cap expires with the addition of a new owner.)	**Tasked TIQC**	**Discussed** **Recommend ations involve guidance for setting limits, possibility of no grandfather clause, establishing a control date for further permit acquisition.**
Tracking and Monitoring	A-2.3.1	Elements of the tracking and monitoring program (set)	**N/D**	**N/D**
Program Costs	A-2.3.3	Costs to include for recovery and fee structure (specify)	**N/D**	**N/D**
Additional Measures for Processors	A-2.4	For processors, whether to: • limit duration of QS issued to processors, • limit application of the accumulation limit grandfather clause, • dedicate adaptive management QP to processors that show they have been harmed.	**o N/A** **o N/A** **o see A-3**	**N/D**
Adaptive Management	A-3	Whether to create an adaptive management program and set aside 10% of the allocation for it. If adaptive management QP are issued, do they need to be tracked separately, i.e. is it OK for processors to receive them through QP transfers during the year?	**Yes**	**N/D**

Table 2. IFQ Alternative, decision points and GAC/TIQC recommendations. (N/A = not applicable based on other decisions made. N/D = not discussed)

Topic	Sections	IFQ Alternative Decision Points	GAC	TIQC
Halibut IBQ	A-4	How to develop a individual bycatch quota program for Pacific halibut.	**N/D**	**Recom-mendations Provided for Info Gathering**
Alternative Scope	A-5	Whether to have IFQ only for whiting in the whiting sectors (i.e. no IFQ for bycatch species).	**N/D**	**See A-1.1**
Fixed Terms and Auctions	A-6	Whether to explicitly limit the duration of the QS to 15 years and have biennial auctions of 20% of the QS after the first term expires. Might want to use 16 year term thereafter to match up with biennial management cycles.	**N/D**	**N/D**

Table 3. Co-op Alternative, decision points and GAC/TIQC recommendations. (N/A = not applicable based on other decisions made. N/D = not discussed)

	Sections	Co-op Alternative Decision Points	GAC	TIQC
		For All Whiting Sectors (B-1)		
Annual Whiting Rollovers	B-1.2	Yes or no.	**No**	**N/D**
Bycatch Species Management	B-1.3	**Species Covered.** Similarly to what was noted for IFQs with respect to nearshore species (A-1.3), there may be species very rarely taken in the whiting fishery which might be better managed passively.	**N/D**	Recom-mended Optoins. See Report.
Bycatch Allocation Subdivision	B-1.3.1	Options: None. By sector. By sector and between co-op and non-co-op fishery. By sector, by co-op and to non-co-op fishery.	**By Co-op**	**N/D**
Bycatch Management	B-1.3.2	If there is no subdivision: will there be seasonal releases at the start of the program. If there are subdivisions: • will there be a rollover and will • there be bycatch buffers for the non-co-op fishery.	**Allow Rollover. No preferred option on buffers.**	**N/D**
Mandatory Data Collection	B-1.5	Whether to have a mandatory data collection program	**N/D**	**N/D**
Adaptive Management	B-1.6	Whether to have an adaptive management program	**Yes**	**N/D**
		Mothership (MS) Sector (B-2)		
Participation	B-2.1	The degree to which a vessel may participate as a mothership and catcher processor in the same year	**Not in same year**	**N/D**
Catcher Vessel Endorsement Qualifying Requirements	B-2.2.1.a	Options for alternative qualifying periods (1994-2003 and 1997-2003)	**Added 1994-2003 as an allocation period option.**	**Noted 1994-2003 options should allow dropping of 2 worst yrs.**
Whiting Endorsement Transferability	B-2.2.1.b	Can the catcher vessel mothership sector whiting endorsement be transferred separate from the limited entry permit?	**Yes**	**N/D**
Accumulation Limits	B-2.2.1.c	What should be the accumulation limit for catcher vessels	**N/D**	**N/D**
Mothership Permit	B-2.2.2.a	Does the MS vessel owner or charterer get the permit?	N/D	N/D
Transferability	B-2.2.2.c	Can the permit be transferred to a catcher- processor vessel during the year? How many times may the MS permit transfer during the year?	No N/D	N/D N/D

Table 3. Co-op Alternative, decision points and GAC/TIQC recommendations. (N/A = not applicable based on other decisions made. N/D = not discussed)				
	Sections	**Co-op Alternative Decision Points**	**GAC**	**TIQC**
Usage Limit	B-2.2.2.d	What cap should there be on the amount an entity owning a MS permit may process?	Add 40% option.	N/D
Number of Co-ops	B.2.3.1	Should multiple co-ops be required (separate co-ops for each MS)?	**No**	**N/D**
Co-op Agreement Standards	B-2.3.3	To be refined.	**N/D**	**N/D**
Processor Ties	B-2.4 B-2.4.1	What percent of the deliveries should be tied to a processor? What period should be used to establish the processor ties?	**100%** "Most recent year" Asked for definition.	**N/D** N/D
Mothership Withdrawal	B-2.4.3	If a MS withdraws and no mutual agreement is reached with vessels, what happens to the ties if the MS returns?	**N/D**	**N/D**
		Shoreside Sector (B-3)		
Whiting Endorsement Transferability	B-3.2.1.b	Can the catcher vessel shoreside sector whiting endorsement be transferred separate from the limited entry permit?	**N/A**	**N/A**
Co-op Agreement Standards	B-3.3.3	To be refined.	**N/A**	**N/A**
Processor Ties	B-3.4.1	What period should be used to establish the processor ties?	**N/A**	**N/A**
Duration and Modification of Ties	B-3.4.2	Options on the duration of participation in the non-co-op fishery required to release its vessel from ties to a processor. Whether or not linkages are re-established when a vessel returns from the non-co-op fishery.	**N/A**	**N/A**
Exclusion of Processor Ties and Processor Licensing	B-3.6	Option to exclude from the program all provisions related to processor ties and licensing.	**N/A**	**N/A**
Catcher-Processor Sector (B-4) (No Decision Points Within the Alternative)				

Public Testimony for Agenda Item F.6, Amendment 20: Trawl Rationalization Alternatives

A substantial volume of public testimony is expected under Agenda Item F.6, Trawl Rationalization Alternatives. The public is encouraged to assemble panels to present common perspectives, to eliminate repetitive, duplicative comments. Individuals not on panels are encouraged to state their agreement or disagreement with panel perspectives, again in an effort to reduce redundant comments and save time; new perspectives not mentioned by panels are encouraged.

Possible panels include:

1. Fishery participants in the Catcher-Processor Sector;
2. Fishery participants in the Mothership Sector;
3. Fishery participants in the Shoreside Whiting Sector;
4. Fishery participants in the Shoreside Non-Whiting Sector;
5. Processors;
6. Non-governmental organizations that are not fishery participants.

Panels would be composed of three to six people and be provided 15 minutes.

Non-panel, individual testifiers will likely be afforded less than the standard time allowance, to accommodate the time constraints of the meeting. This is in accordance with advance notice that time allowed for testifying may be reduced by the Chair, if necessary.

PFMC
06/10/08

EXCERPT FROM THE ANALYSIS

CHAPTERS 4 AND 10

OF

RATIONALIZATION OF THE PACIFIC COAST GROUNDFISH LIMITED ENTRY TRAWL FISHERY

PRELIMINARY
DRAFT ENVIRONMENTAL IMPACT STATEMENT

INCLUDING
REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

PREPARED BY
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JUNE 2008

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CHAPTER 4 EFFECTS OF THE ALTERNATIVES

This chapter examines the environmental and socioeconomic impacts of the alternatives considered for rationalization of the west coast groundfish trawl fishery. The impacts of the alternatives are compared to the baseline conditions of the fishery that represent the expected status of the natural and social environment prior to the implementation of a rationalization program.

The estimated impacts of rationalization that are described in this chapter are the best estimates of what is expected to occur under a rationalization program, but in some instances are better described as estimates of what is likely to occur. In this analysis we use several analytical tools to provide a picture of what the affected environment is likely to look like under several example rationalization programs that encompass the range of alternatives described in Chapter 2. These tools are based on social and economic theory, known relationships that exist between harvested species and other portions of the natural and human environment, and empirical data that shows how affected stakeholders will respond to the incentives created by rationalization, among other things. This information is used to illustrate how the affected environment will be impacted by the rationalization of the west coast groundfish trawl fishery and how those impacts differ between the alternatives under consideration.

This chapter begins by describing the framework that is used to analyze effects. This framework uses an additive approach for assessing the cumulative effect of the alternatives under consideration. This additive model is best described as the sum of existing conditions, reasonably foreseeable actions, and the effect of the alternatives. The effect of each of these categories on the affected environment is assessed independently and the sum of the categorical effects results in the overall, or cumulative, effect. Within the section describing the analytical framework we also describe a series of possible rationalization programs – referred to as analytical scenarios – that serve as the basis for estimating impacts. These example programs were created to illustrate the effects of rationalization from an overall, programmatic perspective and to show how the options under consideration in the alternatives will act in concert with one another when combined into a single rationalization program. We then briefly describe some of the principal tools that are used to assess the effects of the alternatives. Finally, we show how each environmental component will be impacted by estimating the effect of the analytical scenarios on each portion of the affected environment described in Chapter 3.

- Description of the Analytical Framework and Timeline – Section 4.1
- Description of Analytical Tools used to Assess Impacts – Section 4.2
- Effects of Rationalization – Section 4.3

4.1 Analytical Framework

4.1.1 Additive Model for Analyzing Effects, Including Cumulative Effects

CEQ regulations at 40 CFR 1508.25 identify three types of impacts that must be considered in an EIS: direct, indirect, and cumulative effects. Direct and indirect effects are causally related to the proposed action: they are directly related to the action (occurring at the same time and place) or are indirect in that there is some intermediate cause-and-effect between the proposed action and the actual effect being evaluated in the analysis (occurring at a distance in time and/or place). The regulations also define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such actions." Although the regulations and guidance identify cumulative effects as a separate, third class of impacts, all effects can be viewed as cumulative to the extent they are part of some causal chain that results in an ultimate effect on an environmental component. Using this concept of cumulative effects, this EIS frames the analysis in terms of an additive model. To arrive at the final, cumulative effect on an environmental component, the effects in a causal chain are traced out and measured qualitatively or quantitatively, in terms of the metrics that have been identified in this EIS. The components in this additive model include baseline conditions, reasonably foreseeable future actions, the effect of the proposed action, and any mitigation that is proposed separately from the alternatives. Baseline conditions describe the past and present status of environmental components as well as the future status of those environmental components under status quo regulations; reasonably foreseeable future actions are actions that are anticipated to occur in the future and generally include proposals that are in the planning and development stage; the effect of the alternatives is the predicted impact of the alternatives being considered; and mitigation includes proposals that are separate from the alternatives that are designed to mitigate the effects of the alternatives.

Table 4-1. Components included within the additive model for determining cumulative effects.

Components of Additive Model	Description
Baseline Conditions	The past and present status of environmental components and the future status of those components under status quo management measures
Reasonably Foreseeable Future Actions	Actions that are anticipated to occur in the future and generally include proposals that are in the planning and development stage
Effect of the Alternatives	The predicted impact of the alternatives being considered
Mitigation	Proposals separate from the alternatives that are designed to mitigate the effects of the alternatives. These are added to – or subtracted from – the baseline to arrive at the cumulative effect

Based on this evaluation, a determination of whether the proposed action will result in significant impacts to the human environment will be made by the responsible program manager (Regional Administrator, NWR) and described in the record of decision (ROD), based on the information provided in this EIS. To determine the potential for significant effects, the impacts described in this EIS may be compared to a threshold, if one exists in Federal, State, or local law (1508.27(b)(10)); or in land use plans, policies or controls for the area (1502.16(c)); or can be defined in terms of an inconsistency with such laws, policies or plans (1506.2(d)). If no such threshold can be identified, then the alternatives are evaluated comparatively to identify which one has the least effect in terms of the metric concerned. (Although this is an additive model, it should be noted that component effects can be “subtractive” to the degree that they are in fact mitigative; conceptually this can be likened to adding a negative number.)

This additive model is applied within the framework of the EIS by describing in Chapter 3 actions other than those of the alternatives under consideration and their effects; this serves as the description of the “affected environment.” The affected environment is thus a summary of current conditions, which results from the interaction between past and present actions and underlying natural phenomena, and is described in terms of the same metrics used in Chapter 4. In addition, Chapter 4.1.3 catalogues those factors likely to alter the condition of evaluated environmental components in the future—reasonably foreseeable future actions—in terms of the metrics. This projects the affected environment, or environmental baseline, forward in time by considering the interaction of these foreseeable actions with the natural phenomena.

Chapter 4 evaluates the impacts of the alternatives. This includes a description of how these alternatives affect the evaluated environmental components, in terms of the metrics, and a summation of these effects in combination with projected environmental conditions; this represents the cumulative impact assessment. The alternatives are also compared to the no action alternative, which represents baseline conditions if the current management program remains in place. The following sections describe the components of the additive model that are not discussed in Chapter 3. These components include the baseline conditions, reasonably foreseeable future actions, and the effect of the alternatives. Also discussed is the analytical timeline which shows the assumed timeline for various aspects of groundfish fishery management and policy implementation from the present date through 2016.

4.1.2 Baseline Conditions

A major analytic assumption is the baseline, which is used as the reference point for determining the incremental effect each alternative will have on the resource and stakeholder groups of interest. Chapter 3 of this document contains a comprehensive description 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 past and present status of environmental components and the future status of those components under the existing management framework and associated regulations. In general, the baseline condition for this effects analysis is the expected future status of potentially affected resource and stakeholder groups absent any reasonably foreseeable future actions or implementation of a rationalization program. 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 (e.g., by incorporating variation over time) and to put those conditions into a broader perspective. The cumulative past and present effects of groundfish fishery activity, as well as effects external to the groundfish fishery such as other human-induced impacts and climatic events influencing the resource and stakeholder groups, all contribute to the state of the baseline condition.

The following bulleted list summarizes the assumptions made regarding past and present trends in the affected environment that are expected to continue post-implementation and are considered part of the baseline:

- 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 seafood.
- 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.
- Widow rockfish stocks will be declared rebuilt during the time-line of analysis and will be removed from "overfished" status.

The following bulleted list summarizes the assumptions with respect to the past and present actions (regulations) that will continue in the foreseeable future and are considered part of the comparative baseline:

- Rockfish Conservation Areas and Essential Fish Habitat areas will remain in place.
- Sector bycatch limits for overfished groundfish will continue to be used for the non-tribal whiting fishery under status quo management.
- All other enforcement, monitoring, catch accounting, and observer coverage levels will be equivalent to those seen in 2007 under status quo management.
- ABCs and OYs in effect for 2007 and 2008 will be used for fishery analysis purposes. Projections of stock abundance will be based on the most recent assessments available at the end of 2007.
- The future OYs of rebuilding species will be assumed to be as constraining to status quo fishing activity as the OYs set during the 2007–08 management cycle.[1]

While it would be more desirable to use the 2009–10 ABCs in this analysis, the 200910 OYs will not necessarily be known in time to complete the analysis for decision making. Therefore, adopting 2009–10 OYs is not conducive to the analysis of this EIS, so 200708 OYs will be used as a means of

[1] The allowable catch levels (OYs) of rebuilding species constrain harvest activity of target species. In the 2007–08 process, the Council selected various rebuilding species OYs that have varying levels of constraints on harvest activity. In general, the OY of canary rockfish predominately constrains harvest activities along the continental shelf and slope in areas off northern California, Oregon, and Washington. Yelloweye is expected to become equally, or more, constraining to trawl harvest activities in the near future as the OY for that species decreases. Darkblotched rockfish and Pacific Ocean perch constrain harvest activities along the continental slope in the same general latitudinal area. In areas to the south off central and southern California, cowcod and bocaccio constrain harvest activities along the continental shelf.

analyzing the alternatives. Potential variations in groundfish species ABCs and OYs are treated as a source of uncertainty in the analysis and the impact of these potential variations are displayed.

4.1.3 Catalog of Reasonably Foreseeable Future Actions

In general, reasonably foreseeable future actions (RFFAs) are expected to occur independent of the alternatives considered in this EIS, however, their impact is an important consideration in determining the cumulative impact of the proposed action or the alternatives. RFFAs will be implemented after the proposed action is implemented. The RFFAs considered in this EIS are at different stages of development than others and this means that the outcome of the RFFAs considered in this EIS are at different levels of certainty, though it is important to note that only those future actions that can be reasonably well anticipated are included. In general, RFFAs are those actions that have reached the proposal stage as defined in CEQ regulations at 40 CFR 1508.23.

The following list of reasonably foreseeable future actions was developed based on Council workload priorities and the agenda topics for Council meetings through the end of 2007. This list represents the assumed actions that will be put in place that are not part of status quo or baseline conditions:

1) Amendment 10 will be approved and implemented creating an at-sea monitoring system for the shorebased whiting fishery.
2) The groundfish open access fishery will be licensed, creating a defined universe of participants and stabilizing management in that fishery.
3) The Groundfish Essential Fish Habitat 5-year review will occur and may add new closed areas.
4) Amendment 21 (Intersector Allocation) will be approved and implemented creating sector-specific allocations of groundfish species.
5) Ongoing biennial harvest specifications will continue, including the 200910 specifications and beyond.

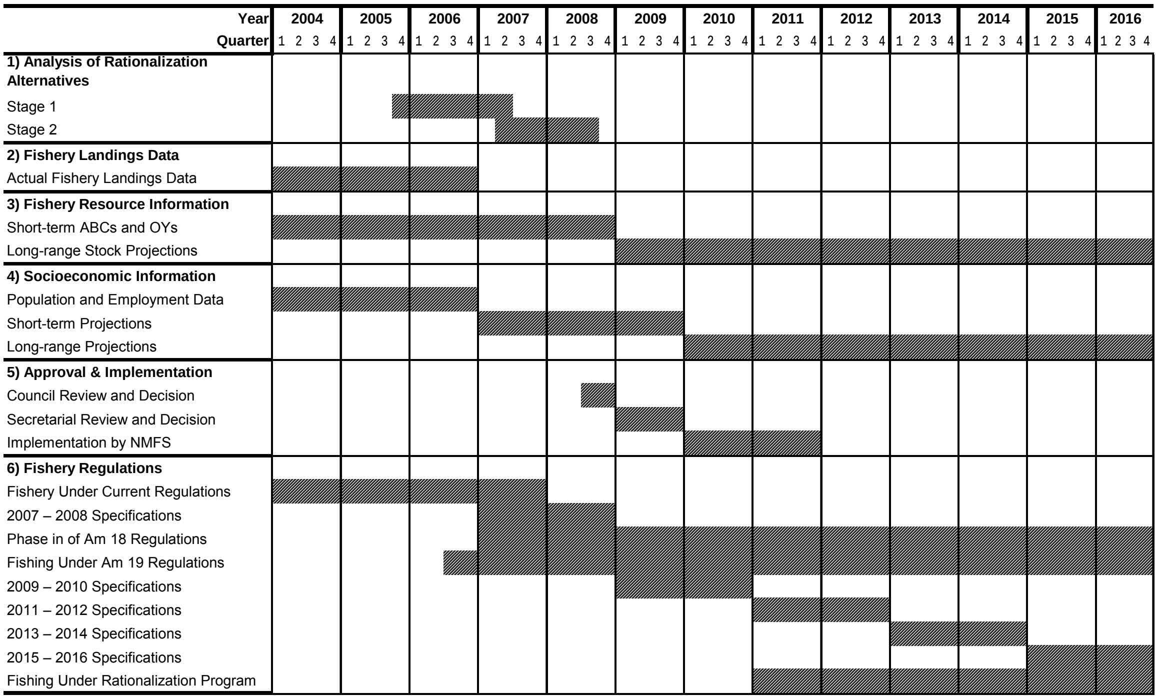
4.1.4 Analytical Timeline

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 during which the analysis will occur, and the period over which the analysts must make projections. In general, there is a substantial 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, the DEIS is scheduled to be released in the fall of 2008.[2] The effects of the proposed action are not expected to occur until 2012 because of the time needed for Secretarial approval and the development of necessary infrastructure and personnel. Those effects most likely will not be fully realized until some years later because of the time necessary for the fishery participants to adjust and adapt to the new regime.

Figure 4–1 is a quarterly timeline for analysis and implementation of the trawl rationalization program from 2004 through 2016. The first section of the figure, labeled “Analysis of Rationalization Alternatives” indicates the time frame over which the analysis of the trawl rationalization program takes place. Sections 2 through 4 show the availability of key data sets 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. The last section of the figure, Fishery

[2] The reauthorized Magnuson-Stevens Fishery Conservation and Management Act states that the Council shall submit a plan for rationalization of the west coast groundfish trawl fishery within two years of reenactment of the act. The release of the DEIS in fall of 2008 is scheduled to facilitate the development of the rationalization plan by the end of 2008, which will meet the congressionally mandated deadline.

Regulations, indicates the timing of regulatory changes that are projected to occur during the first years of fishing under the program.



Note: The fact that the timeline begins in 2004 does not mean that data from earlier periods will not be used in the analysis.

Figure 4–1. Trawl rationalization program analytical and implementation timeline.

As seen in the first section, Stage 1 of the analysis (development of the analytical framework and outline) runs approximately one and a half years. The second stage of the trawl IFQ program analysis begins in the second quarter of 2007 and runs through the third quarter of 2008.

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 2006 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 2-year periods, and Council recommendations are made at the end of the second quarter each even-numbered year. This means that ABC and OY specifications for 2009 and 2010 will not be recommended by the Council until June of 2008, which is the same time that the preliminary draft analysis of trawl rationalization is scheduled to be completed. Therefore, actual ABC and OY specifications for the 2009 and 2010 fishery will not be available early enough to inform the trawl rationalization analysis. Harvest specifications for 2007 and 2008 provide an indication of the stock levels and OYs for the near term and also provide longer range projections. As indicated in the figure, these long-range projections of stock sizes are likely to be generally available through 2016 for most species.

The fourth section of the figure deals with available socioeconomic information. In general, population and employment estimates through 2006 will be available at the community or county level by the time Stage 2 of the analysis is underway. Reliable population and employment projections through 2009 should also be available, but projections beyond 2009 are likely to be less certain, primarily because population estimates are recalibrated every 10 years to the decennial U.S. Census.

Assuming that the analysis of the trawl rationalization program proceeds as scheduled, the Council should receive a preliminary draft analysis at the end of the second quarter in 2008 (June Council meeting), and is presumed to make its final recommendations by the end of that year (November Council meeting). Following the Council decision, it is presumed that development of a draft EIS for Secretarial review will be required. Drafting of plan amendment language, implementation plans, proposed changes to the regulations, and the Secretarial review and decision process will require at least a full year (2009). Assuming the Secretary approves the program, it is anticipated that implementation of the program by NMFS will require an additional year.

The sixth and final section of the figure shows the major regulatory regimes under which the fishery will operate between 2004 and 2016. The current regulations are expected to remain in effect through 2008. On January 1, 2009, new biennial groundfish stock and harvest specifications will be implemented. Some additional regulations, such as Amendment 10, will also have been put into place. It is assumed that fishing would continue under those regulations through 2010. In 2011, it is anticipated that fishing under the trawl rationalization program would begin.

The end of 2016 is used as the “end point” for the analysis. The time horizon of the analysis is more than a few years after implementation of an alternative management regime in order to include fleet consolidation and other possible effects.

4.1.5 Analytical Scenarios

The existing suite of alternatives specify two alternatives in addition to status quo. Within each of these alternatives are many sub-options that may have different impacts on the affected environment when examined in whole or in part. Each of the sub-options may have noticeable impacts on the affected environment if one is chosen over the other, but equally important is the combined suite of a series of sub-options that are potentially chosen and the overall impact of the combined suite of sub-options. Given the number of sub-options that exist in the suite of alternatives, there are a large number of potential combinations that would make the analysis of the alternatives unfeasible if every potential combination were analyzed. Since the potential number of sub-option combinations is large, a suite of “analytical scenarios” were developed that serve as the focal point of the analysis. These analytical scenarios strategically combine a series of potential sub-options with the intention of illustrating the trade-offs that exist within the alternatives while keeping the analysis and consideration of options within a defined and feasible set. These analytical scenarios are intended to make the analysis feasible and tractable while encompassing the range of potential effects of the alternatives.

Analytical scenarios are meant to illustrate how different decision points can impact the outcome of a trawl rationalization program. These scenarios were developed so that each suite of sub-options making up the analytical scenario results in noticeable differences in the impact on the affected environment. Some sub-options are not illustrated in the analytical scenarios because the decision to choose one option or the other is not expected to have a noticeable impact on the program or the environment as a whole. It should be noted, however, that such options are considered in the components analyses that are included as appendices.

Five analytical scenarios are illustrated below and these scenarios are referred to throughout Chapter 4 in illustrating the impact of a trawl rationalization program on the affected environment. It should be noted that status quo is not shown in the table but is considered in the analysis and referred to as Scenario 1.

ELEMENT	ANALYTICAL SCENARIOS FOR ILLUSTRATING IMPACTS: Preferred Alternative	Scenario 2	Scenario 3a	Scenario 3b	Scenario 4	Scenario 5
Catch Control Tool		IFQ for all Trawl Sectors	IFQ for all Trawl Sectors		• IFQ for Non-Whiting Trawl • Coops for Whiting Trawl	• IFQ for SS Trawl • Coops for At-Sea Trawl
Initial Allocation and Qualification		Based on catch history	Based on catch history		• Equal sharing of buyback history in Non-whiting • Rebuilding stocks allocated on a bycatch rate • CV coop endorsement 97-03	• Equal sharing of buyback history in SS • Rebuilding stocks allocated on a bycatch rate • CV(MS) endorsement based on 97-03
Accumulation Limits		• SS non-whiting grnd: 3% ctrl & 6% per vessel • SS whiting: 25% ctrl & 12% per vessel • MS: 25% ctrl & 50% per vessel • CP: 60% ctrl & 75% per vessel	• SS non-whiting grnd: 3% ctrl & 6% per vessel • SS whiting: 25% ctrl & 12% per vessel • MS: 25% ctrl & 50% per vessel • CP: 60% ctrl & 75% per vessel		• SS grnd: 1.5% ctrl & 3% per vessel • CV(SS) whiting: 15% • MS: 20% • CV(MS): 10% • CP: none	• SS grnd: 2.2% ctrl & 4.4% per vessel • SS whiting: 25% ctrl & 12% per vessel • MS: 30% • CV(MS): 15% • CP: none
Grandfather clause		Grandfather clause exists	Grandfather clause exists		None	Grandfather clause exists
Processor Initial Allocation / Coop Affiliations		None	None	25% of groundfish, 50% whiting to SS and MS	• 100% Processor affiliations in MS and SS whiting sectors. • 25% SS processor alloc of SS groundfish	• 50% Processor affiliation in MS sector • 50% SS processor allocation of SS whiting • No processor allocation of SS groundfish
Species Covered		All groundfish and Pacific halibut	All groundfish and Pacific halibut		• All groundfish in non-whiting sector • Whiting in whiting sectors with bycatch pools that are common across all whiting sectors	• All groundfish in SS sector • Whiting is covered at sea. At sea sector bycatch is allocated at co-op level
Number of Trawl Sectors		Three	Three	Three	Four	Three
Adaptive Management[3]		None	10% A.M. holdback	None	10% A.M. holdback for all sectors	10% A.M. holdback for SS
Area Mngmnt		None	None	None	Species split at 40 10 N lat	Species split at 40 10 N lat
Carry-over		Carry-over exists	Carry-over exists		No carry-over	Carry-over exists
Tracking and Monitoring		Placeholder	Placeholder		Placeholder	Placeholder

The approach for specifying the analytical scenarios was to construct scenarios in addition to status quo that show outcomes based on a range of market flexibility in the program. In addition to market flexibility, several key features are varied to show their effect on the environment.

[3] For analytical purposes, the adaptive management provision will be assumed to be used to A) mitigate against the effects of the program on adversely impacted communities, B) provide incentives to use habitat and bycatch friendly gear, and C) to mitigate against adverse effects of the program on processors (this is specific to scenario 3a).

- Scenario 1 is Status Quo

Scenario 2 is market-centric with a high level of individuality and individual accountability. This scenario is intended to illustrate the effect and pull of market incentives on the program. Illustrating the effect of the market without special provisions serves as a benchmark in order to help inform other decisions that may be made such as building in special provisions to hedge against market influence. In other words, before considering special provisions in the program, it is worthwhile to understand why those provisions should or should not be incorporated. This scenario is intended to reflect those underlying reasons.

In this scenario, a focus on market outcomes is achieved by issuing IQ to entities and by requiring that all groundfish species and Pacific halibut be covered with IQ. Allocating IQ to individuals for all groundfish species and Pacific halibut means that market incentives apply to all groundfish catch and Pacific halibut. If species were not covered by IQ, the market would not have an effect on the catch of those species because they would not be directly managed by the rationalization system, which by definition, is market based management institution. Issuing IQ (instead of establishing co-ops) is intended to isolate the effect of the market to individuals by holding individual entities accountable for their own catch. Co-ops may result in a slightly different outcome because of their collective, community nature. This scenario also focuses on market outcomes by establishing three trawl sectors (versus four). Three trawl sectors allows the market to have a greater influence over the harvest strategies of fishing entities instead of separating harvesting opportunities into four segments. This scenario does not include an adaptive management program because an adaptive management provision would be designed to directly influence, or modify, outcomes that are driven by market incentives. A carry-over is specified as part of this program because a carry-over provides for more flexibility in making harvesting choices across years, which is consistent with a market-driven approach. Accumulation limits in this scenario are set at the high end of the range specified in the alternatives, and there is also a grandfather clause. These provisions would allow more consolidation in the fishery than other options.

Although as constructed harvesters receive the entire initial allocation, this scenario would not preclude an allocation to processors. The harvester-only allocation illustrates the effect of the market on the program while disentangling the harvester and processor initial allocation issue and the effects on the program that are caused by splitting the initial allocation between harvesters and processors. Since the current suite of alternatives has an option to allocate 100 percent to harvesters, but not an option to allocate 100 percent to processors, this scenario allocates 100 percent to harvesters in order to better isolate the influence of market incentives on the program.

The focus on individuality in this scenario is accomplished by issuing IQ (versus co-ops) for all sectors of the fishery. This creates a more individualistic perspective based on the notion that IQ tends to make participants focus on their personal perspective, whereas participants in a harvest cooperative act within a type of community.

- Scenario 3.a and 3.b are similar to scenario 2, but address the Council's request to compare and contrast two methods for responding to processor concerns. One method is to make an initial allocation of IQ to processors and the other method is to use an adaptive management system to assist processors that are adversely impacted by a rationalization program. The two mechanisms for responding to processor concerns have substantially different philosophies—and presumably impacts—that are explored in the analysis. It is anticipated that the initial allocation of IQ to processors would tend to leave many aspects of the outcome up to private industry and the market, whereas an adaptive management program to mitigate potentially adverse effects on processors would allow the Council to mitigate some of the impacts of the program. The differences between these two approaches are explored in this analytical scenario.

- Scenario 4 uses market-mitigating factors and harvest cooperatives (instead of IQ) for the whiting fishery. This scenario places constraints and controls on market outcomes through sector divisions, not having a grandfather clause provision, an adaptive management mechanism, relatively small accumulation limits, and area management. This scenario gives more influence to processors by giving them relatively large IQ allocations and requiring that co-ops be linked to shorebased processors and motherships.

  Imposing harvest cooperatives on three sectors of the fishery is expected to result in some different outcomes than issuing IQ for all sectors. Harvest cooperatives are like a community where members collectively decide the allocation of fishing opportunities. The effect of this type of system is expected to be somewhat different than an IQ system where harvesters may be more likely to engage in fishing opportunities independently.

  In this scenario, the species covered in the whiting fishery are limited to whiting and bycatch species. This means that the market-based program does not directly influence how many of the species are caught that do not fall under the whiting or bycatch species category. This lessens the impact the market has on harvests and changes the degree of individual accountability associated with the harvest of groundfish species.

  Overfished stocks are allocated based on either the bycatch rate allocation approach, or based on a pro-rata to the whiting allocation. The approach depends on the sector, but the intention is to establish a more “equitable” initial allocation than using catch history.

- Scenario 5 is intended to be intermediate to scenarios 2 and 4 by allowing for more market-driven outcomes than scenario 4. This scenario imposes harvest co-ops for the at-sea portion of the trawl fishery instead of all whiting sectors. Shoreside whiting and non-whiting activity is covered through IQ on all species. A more moderate degree of market influence is achieved by allowing carry-over provisions, allowing for three trawl sectors, establishing accumulation limits that are between scenario 2 and 4, and requiring that 50 percent of a vessel’s catch history in a co-op program be linked to a mothership (instead of 100 percent of catch history).

Several components within the existing suite of alternatives are not varied across the analytical scenarios. They are assumed to be features of all the analytical scenarios or are generally not expected to have a noticeable impact on the program. Although these components are not specifically mentioned as elements within the analytical scenarios it is necessary to establish these assumptions/exclusions to understand the effects of the analytical scenarios. Those elements that are not specifically analyzed as part of the analytical scenarios are examined in Appendices A and B.

The assumptions and exclusions are:

- Gear switching is allowed in all IFQ programs
- All existing processors that participated during the allocation years qualify to receive IFQ under the IFQ alternatives.
- Non-whiting species are allocated to whiting sectors on a pro-rata basis, where the percentage of non-whiting species received is equivalent to the percentage of whiting received.

- Under the shoreside whiting co-op, the processor linkage is based on 2000-03 history
- Under the mothership co-op, the processor linkage is based on the most recent year
- The qualification for the catcher-processor endorsement is one delivery from 1997-2003
- To qualify for the mothership permit the entity must have received more than 1,000 mt in any 2 years from 1997-2003
- To qualify for the shoreside processor permit the entity must have received more than 1,000 mt in any 2 years from 1998-2003
- All other potential elements of the program are analyzed in Appendix B or C.

4.1.6 Uncertainty in Predicting Outcomes

Given the complexity of the affected environment in which the west coast groundfish trawl fishery occurs, the estimated impact of trawl rationalization is somewhat uncertain. To some degree, the areas of uncertainty and the magnitude of uncertainty can be identified, and therefore, the analysis is able to consider impacts that are uncertain and the degree to which the actual impact can deviate from the estimated impact of the alternatives.

There are several sources of uncertainty that affect the analysis, including the timeline (long versus short-term impacts). Because the impact of trawl rationalization over the longer term is less certain and biological status of stocks and the resulting allowable trawl sector catch (OY) the trawl sector may receive because of the biological status of stocks and the level of trawl sector allocations that are made.

Several sources of uncertainty are identified ahead of time in order to consistently illustrate the potential range of impacts associated with the uncertainty involved. Some of these sources of uncertainty can be quantified to some degree. In these cases, uncertainty is characterized with a sensitivity analysis that "brackets the range" of likely outcomes. Known sources of uncertainty with effects that can be reasonably well quantified include:

- Future ABC/OYs of groundfish species.
- Trawl sector allocations of groundfish species.
- The ability of trawl vessels to successfully avoid overfished stocks.

Sources of uncertainty that are known to exist but whose effects cannot necessarily be quantified include:

- The likelihood that a stock will become overfished.
- The potential that an overfished stock is rebuilt.

These factors are considered as part of the impact of the analytical scenarios. In some cases, other areas of uncertainty are uncovered that may be pertinent to an individual environmental component. In such cases, these aspects of uncertainty are addressed within the analysis even though they may not be listed here.

4.2 Analytical Tools for Assessing the Impacts of Trawl Rationalization

Preliminary analysis and public scoping has indicated that the rationalization of the west coast trawl fishery could result in substantial impacts to various aspects of the social and natural environment. In addition, shifts in the location of fishing effort and changes in the amount of fishing-induced groundfish mortality are expected that will have impacts to the status of west coast groundfish stocks and the marine ecosystem. In this section, we describe the principal analytical approaches that are used to address these, and other impacts of trawl rationalization.

The modifications to the management regime needed to rationalize the fishery changes the way fisheries are prosecuted and this change leads to secondary and tertiary effects on aspects of the social and natural environment. The reasons for these changes in the fishery result from profit motivation and individual accountability. Rationalization changes the way fishermen prosecute fishery activities in the form of effort (both spatial and in total magnitude), the volume and type of species harvested, and the number of vessels used to prosecute fishing activity. These changes have social and economic effects on various aspects of the affected environment, biological effects on fishery resources, and ecosystem effects.

Drivers that Cause Changes under Rationalization	Factors Changing under Rationalization	Resulting State	Impact
• Defensibility of Harvest Privileges • Profit motivation • Total catch accountability • Ability to consolidate • Market conditions • Resource accessibility • gear switching	• Fishing Behavior • Overall Fishing Effort • Spatial Fishing Effort • Length of Fishing Season • Fleet Size • Processing Capital • Catch Disposition • Catch Quantity	• Number of Vessels • Location of Vessels • Amount and Location of Processing Capital • Fish Population	• Net Economic Impact o Impact to harvesters o Impact to processors • Community Impact o Economic o Social • Fish Abundance

Other impacts are certain to occur as a result of the alternatives being considered for rationalization of the west coast fishery. Some impacts may come in the form of exvessel prices paid to harvesters because of the relative degree of processor influence over harvesting privileges and the negotiation that occurs between the two groups. However, these other effects can be weakly differentiated from the effect of rationalization itself.

Substantial impacts may be realized on the harvesting side via changes to the status of trawl catcher vessels, permit holders, captains, and crewmembers. Substantial impacts may also be realized on the processing side via changes in the utilization of processing plants, processor access to groundfish landings, changes in the demand for processing labor, and impacts to the processing companies as a whole. These changes occur as a result of changes in the quantity of catch, the type and quality of fish retained, and negotiations that occur between harvesters and processors over ex-vessel prices among other things. Impacts to harvesters and processors have a secondary effect to west coast fishing communities because of changes in the economic status of harvesters and processors, as well as the level, type, and location of employment in both sectors.

The individual accountability and market-based trading aspects of rationalization are expected to result in shifts in harvesting activity that will alter the quantity of fish caught and the location of fishing effort. These changes could impact the status of fish stocks as harvest rates change and there is a resulting change in the removals of some species.[4] Changes in fishing effort and fishing-induced mortality may also alter the ecosystem because of trophic interactions and changes in the location and intensity of fishing effort, which can affect biogenic benthic marine habitat.

[4] ABC and OY levels are determined externally through the biennial harvest specifications process. The analysis assumes that overall harvest levels in a rationalized trawl fishery are bounded by the ABCs and OYs adopted in that process.

Economic theory, data and information collection, and model development were used to understand the impacts of trawl rationalization. Economic theory is used to describe the outcomes of negotiation that occur between harvesters and processors and the outcomes that occur as a result of potential changes in the negotiating power of the two groups. Information collection occurred in order to support model development, but also to provide analytical support for estimating impacts on the socioeconomic environment. Models were developed to support the analysis of several issues, including:

1) The impact of the initial allocation of IFQ.
2) The amount of fleet consolidation expected to occur.
3) The potential for shifts in the location of fishing effort.
4) The potential for changes in revenue and catch as a result of changes in bycatch rates.
6) The comparative advantage of ports and regions in a rationalized fishery.
7) The effect on the California current ecosystem resulting from changes in trawl activity.
8) The regional economic impacts of trawl fishing activity.

4.2.1 Tools for Estimating Impacts

4.2.1.1 *Theory for Illustrating Negotiation Outcomes*

Game theoretical approaches for illustrating the concept of negotiation and bargaining power are used to illustrate the negotiation that takes place between harvesters and processors over exvessel prices. This information is useful for showing how the negotiation stance of each player changes as the initial allocation of quota is divided between harvesters and processors. The logic developed through this approach exposes the relative strength that harvesters and processors have in exvessel price negotiation based on the control each aspect of the industry has over harvesting privileges. We compare the different negotiation stance each industry has in the initial allocation alternatives to the status quo regime. While this tool does not result in a prediction, it is useful for illustrating the trade-offs that exist between the potential allocation scenarios.

4.2.1.2 *Information Collection*

Lessons learned from other rationalization programs

The rationalization of the west coast trawl fishery can benefit from experience in other rationalization programs around the world. An in-depth literature review has been ongoing since 2004 in an attempt at documenting some of the intended and unintended consequences of rationalization programs that have been put in place. This information has demonstrated impacts to communities, catcher vessels, fishery resources, and processors and can be used to show an empirical example of how various policies have impacted portions of the affected environment.

Identification of community vulnerability and resilience

As part of the 2007–08 Annual Specifications and Amendment 16-4 Groundfish Rebuilding Plan Environmental Impact Statement, an analysis of community vulnerability and resilience was conducted. This evaluation estimated dependence of west coast fishing communities on fishing activity and the relative resilience those communities have in dealing with change. This information is useful for considering differential community impacts due to changes in fishing activity. In such cases, a moderate change in fishing activity occurring in a vulnerable community may be considered a substantial impact, while a moderate change in fishing activity in a less vulnerable community may be considered relatively inconsequential.

Documentation of processor ownership, plant location, and port-to-plant product flow

This data collection exercise documented the location and ownership of trawl groundfish processing plants, the ports that those plants receive their groundfish from, the number of trawl groundfish plants owned by seafood processing companies, and whether those plants process whiting and/or non-whiting groundfish. The method for collecting this information is through data available in the PacFIN database, information provided by state port samplers and fisheries information specialists, and information provided by members of industry. This information is used to show the geographic location of plants and product flow, which is useful in illustrating impacts on processors resulting from a change in the location of landing, for example. This information can also be used to evaluate regional and community impacts.

The following table illustrates a hypothetical example of the information collected in this exercise. This table shows the name of a plant, the city of that hypothetical plant, the company that owns that plant, the ports of landing that plant derives its catch from, and whether that plant processes whiting and/or non-whiting groundfish.

Table 4-2. Hypothetical example of processor plant information being collected.

Plant name	Location	Company	Source ports	Whiting port	Groundfish port
A groundfish plant	Astoria, OR	A groundfish company	Astoria	Yes	Yes
			Westport	Yes	Yes
			Neah Bay	No	Yes

By documenting this information, it is possible to illustrate the relationships between processing plants and regional patterns of landings, between processing plants and individual seafood companies, and between whiting and non-whiting harvest levels and individual processing plants. Second and third order effects can also be developed and described, which illustrate the effect on regions and communities that result from an impact on processing plants. For a more in-depth description of the information collected in this exercise, the reader is referred to Appendix C.

Documentation of fishing infrastructure and support business

The Northwest Fisheries Science Center is updating the community profiles that were published in 2006. This update shows the presence of fishing infrastructure and the presence of fishing support businesses, such as net manufacturers and vessel fabricators. This information is useful for showing the level of involvement the various fishing communities have in west coast fisheries. Documenting the amount of infrastructure and support business is also useful for any analysis that relies on the concept of “agglomeration economies,” where a larger number of similar businesses in one place creates economic efficiencies through information sharing and a decrease “transfer costs” and the cost of conducting day-to-day operations. In this case, more fishing business would tend to represent agglomeration and provide an indicator of economic efficiencies that are present or not present in fishing communities along the west coast.

Tracking and monitoring program and cost development

As part of this EIS development, NMFS is constructing options for a tracking and monitoring system that would meet the needs of a rationalized fishery. Options are being researched to determine program costs that can be borne by industry versus those that need to be borne by government agencies. This information has implications for the profitability of participants in the rationalized fishery and implications for management agencies that currently lack adequate resources for enhanced tracking and monitoring systems.

4.2.1.3 *Models*

This subsection describes the models being developed for estimating how portions of the affected environment will respond under each alternative. The choice of models depends upon the amount and quality of information available. Some of the data issues complicating model development for this analysis are:

- Cost and earnings data for individual harvesters are available only for a single year.
- Cost and earnings data for individual processors are unavailable.
- Comprehensive primary data on processed products and product prices are unavailable.
- Final market demand for groundfish products is not well known.
- Data showing the total catch (landings plus discard) of groundfish by individual vessels are unavailable.

Given these data shortcomings, a comprehensive predictive model would not be feasible for development and use in the effects analysis. Instead, a set of models designed to focus on specific issues was developed. These include:

- A model showing the effects of the initial allocation of IFQs in a trawl IFQ program.
- A model assessing the expected amount of fleet consolidation.
- A model illustrating the potential for geographic shifts in fishery patterns.
- A model illustrating the potential to reduce the catch rate of overfished species and the associated potential for increased target species catch and revenue.
- A qualitative comparative advantage model illustrating the potential for regions to be negatively or positively impacted by rationalization.
- An ecosystem-based model describing the impact on the biological and ecosystem components of the environment resulting from changes in fishing behavior and catch.
- A regional input-output model that measures the regional economic impact of changes in catch and revenue occurring in a rationalized fishery.

In addition to these models, available literature and theory are useful for identifying additional impacts that it may not be able to predict, but can be assessed qualitatively fashion. These qualitative evaluations are based on the expertise of analysts and a review of available literature.

Model to assist in assessing the effects of the initial allocation of IFQ

The initial allocation of IFQs may have a large impact on the way in which trawl groundfish harvesters and processors prosecute the fishery, especially in the first few years under an IFQ program. An examination of how quota recipients fare under the initial allocation options relative to current participation levels indicates the socioeconomic impacts resulting from the initial allocations. The initial allocation model is designed to calculate allocations under alternative formula options, and to compare the value of those allocations with recent experience of both permits and processors. Key components of the model include:

- PacFIN fish ticket-level data on LE trawl landings by permit, year and species from 1994–2006. The model also includes data indicating the exvessel purchase of trawl groundfish by buyers or processors. Each trip is categorized as to in which IFQ "sector" it belongs. Compared with the original PacFIN file, the data is also "transposed" so that each species category is represented by two numeric data fields, one for round weight of the landing and one for exvessel revenue.

- Specific allocation rules included in the alternatives (e.g., relative pounds calculated annually for years 1994-2003, dropping a certain number of years, and recent participation requirements). Allocation options currently on the table for permits include: no recent participation requirement, dropping the three worst years from the calculation for non-whiting fishery permits' quota shares, and dropping two years from the whiting fisheries permits' quota share calculation.
- Rules on alternative treatment of the buyback vessels' portion of total quota share. Current options include allocating the buyback portion equally among all permits receiving quota share, or allocating it in the same proportion as the permits' catch history-based quota share.

Results are generated for each permit and processor who is eligible to receive quota share under each allocation option. Results are rolled up to the business entity level in cases where owners control multiple buyer/processor codes and/or LE trawl permits. It is also possible to combine processor and permit allocations to show total quota share amounts that would be allocated to entities with eligible history from both buying/processing activities and landings.

These results are used to assess quota share concentration implications of the initial allocation, and to compare the annual catch value of allocated quota shares with the value of harvest and/or buying activity exhibited in recent years. Average 2004–06 exvessel revenue is used for this comparison.

Model to assist in assessing the expected amount of fleet consolidation

Consolidation under the alternatives will be a key impact mechanism. This model provides projections of consolidation in the fishery and the effects of that consolidation. This model is based on work published by Weninger and Waters {Weninger and Waters, 2003}.

Ex ante benefit estimates (estimates prior to the action) are obtained using a two-step methodology. The first step predicts the harvesting practices expected to prevail under an ITQ system. This first step will predict post-ITQ equilibrium harvesting practices including:

- Groundfish harvest per vessel.
- Number of vessels needed to harvest limited entry trawl groundfish catch.
- Which vessels remain in the groundfish fishery and which vessels exit.
- Non-groundfish harvest per vessel.

A directional distance function model of a multiple output harvest technology is used for analysis. The directional distance function is well-suited for characterizing fishing practices under alternative regulatory systems. The model is being estimated using data collected in the recently completed West Coast Limited Entry Cost Earnings Survey.

In the second step, estimates of potential economic benefits are generated based on the predicted harvesting practices from the first step analysis. Because the west coast non-whiting groundfish fishery is not a derby fishery, it is expected that economic benefits will come through cost reductions and increased access to target species that arise from modifications in fishing behavior (overfished species avoidance). The key output of the second step in the analysis is an estimate of post-rationalization equilibrium harvesting cost.

Changes in harvesting costs can arise from three sources. First, the total fixed costs incurred by the groundfish trawl fleet change as the size of the fleet changes. Since many limited entry trawlers incur annual fixed costs of at least $100,000, reductions in fleet size can result in substantial cost savings. Second, costs may change as vessels make decisions regarding fishery participation and no longer incur diseconomies of scope (such as the costs of frequently switching gear for participating in multiple fisheries). Third, costs may change as vessels are able to buy and sell quota to take advantage of economies of scale and operate at the minimum point on their long-run average cost curve.

Using the model developed through this project, it is possible to compare:

- Harvesting costs under the current regulatory system.
- Harvesting costs under an "unconstrained" ITQ system.
- Harvesting costs under an ITQ system where fleet rationalization is constrained through program design features such as quota accumulation caps.

This information can be used to help determine community impacts, revenue associated with fishing opportunities under a rationalization program, and the number of boats engaged in the fishery. A prediction of the number of vessels engaged in the fishery has repercussions for estimating the cost of monitoring the fishery.

A comparative advantage model illustrating the potential for regions to be made better or worse off by rationalization

Several variables determine the amount of fishing activity occurring in different ports, including access to fishing grounds, port infrastructure, and fish purchasing and processing among other things. In a rationalized fishery, the incentives created by market-based management and individual accountability may impose additional forces that will alter the decision that vessel operators make regarding the location of fishing activity, the delivery location, and home-port location for a given vessel. Assuming profit is the motivating factor for fishers engaged in commercial fisheries, the decision framework created by a rationalized fishery will tend to shift the location of fishing and delivery activity.

Under status quo management vessels are not held individually accountable for the amount of fish they catch, provided their landings are within their cumulative landing limit. In addition, operators cannot choose to grant their cumulative limit to another, potentially more profitable, operator. Under a rationalized fishery, both scenarios change and fishers are held individually accountable and can transfer their fishing privilege to another vessel. The aspect of individual accountability will tend to put pressure on operators to fish in areas with lower encounter rates of constraining overfished species and the ability for transferring catch privileges allows the fleet to consolidate to fewer, but more profitable vessels as the market directs quota in a manner that is more economically efficient.

In a rationalization program, more economically efficient vessels are expected to remain in the fishery, while less efficient vessels are expected to drop out of the fishery. Economic efficiency is determined by several variables including the ability of the operator to generate gross revenues and the vessel's cost structure. Cost structure is determined by variable costs such as fuel, fixed costs, and also by "transfer costs" and the cost of day-to-day operations. Ports that have a higher degree of fishing support businesses (agglomeration) tend to make it easier and more efficient for operators to conduct day-to-day activities and this makes the cost of running a fishing business, acquiring parts, and negotiating work relationships lower than in other ports.

Given these arguments, it is reasonable to expect ports with vessels that have a relatively long travel time to fishing grounds, have relatively unsuccessful operators, relatively costly vessels, and relatively few support businesses are at a disadvantage when compared to other regions. In addition, ports that are adjacent to fishing grounds with high constraining overfished species abundance would also tend to be at a disadvantage, because the presence of constraining overfished species would encourage operators to move to areas with lower abundance. Given enough disadvantaging (or advantaging) factors in a port, that port may find itself losing (or gaining) trawl groundfish activity after rationalization, absent some mitigation tool that the Council may elect to implement as part of the program.

We use available information to describe the comparative advantage of west coast ports in a rationalized fishery. Four variables are developed and each port is "scored" based on the relative presence of those variables in those ports as shown in Table 4-3. For a more complete description of this model, see the appendix that describes the analytical tools.

Table 4-3. Hypothetical Example of Relative Comparative Advantage Information

Hypothetical Port	Relative Bycatch Rate	Fishing Infrastructure	Economic Efficiency of Local Fleet	Initial Distribution of Quota shares
Hypothetical Washington port	–	–	+	+
Hypothetical Oregon port	+	–	+	–
Hypothetical California port	+	–	–	+

<u>A sub-model illustrating the potential for geographic shifts in fishery patterns</u>

The regional comparative advantage structure will also influence the geographic nature of fish harvesting activities. When the variables described above are combined, the comparative advantage of different ports will influence the level of fishing effort occurring in waters adjacent to those ports and regions.

Individual accountability in a rationalization program is likely to result in cleaner (lower bycatch) fishing practices. In particular, the individual accountability associated with constraining overfished species will encourage vessels to modify gears as well as fish in areas where overfished species are less abundant. In addition, the rationalization program will tend to slow the pace of Olympic-style[5] fisheries that exist in the shorebased and mothership sectors of the whiting fishery. Both of these responses will tend to change geographic fishing patterns. Cleaner fishing practices are likely to result in some pressure to move away from areas where constraining species like canary, yelloweye, and cowcod are more frequently encountered. A rationalized whiting fishery will tend to slow the pace of harvesting, and given that the whiting stock tends to migrate north over the course of the year, this is likely to result in more midwater trawl effort occurring further to the north than under an Olympic-style fishery. These effects may be enhanced or subdued by the economic activity and efficiency of fishing fleets that focus on certain areas. For example, if the fleet originating in a particular port tends to concentrate their effort in an area with a relatively high abundance of overfished stocks, we would expect that fleet to move or for quota shares from that fleet to be sold to other areas of the coast, because it would be more profitable for them to do so.[6] However, if that fleet is relatively efficient and there are shoreside support businesses and infrastructure in ports adjacent to those grounds that make fishing activity in those areas

[5] In this document, the terms "Olympic-style fisheries" and "race for fish" are used synonymously.

[6] Moving or selling quota to another area of the coast would be more profitable in this case because in a relatively low bycatch area more target species could be accessed per unit of constraining overfished species. For example, if vessels can leverage 100 pounds of target species per pound of canary rockfish in one area, but 500 pounds of target species per pound of canary rockfish in another area, more effort would be expected to occur in the second area in order to maximize harvest potential.

more attractive, vessels may continue to fish in those areas even though constraining stocks are relatively more abundant. This is because a more efficient fleet and the presence of shoreside infrastructure can outweigh the effect that a relatively high presence of constraining stocks can have on regional fishing patterns.

The model indicating geographic shifts in fishing effort in the non-whiting trawl fishery is constructed to show areas and regions that are more likely to see less fishing effort and areas that are likely to see more fishing effort. This model uses much of the same information as described in the above section.

The geographic shift in fishing effort in the mothership and shorebased sectors of the whiting fishery is more difficult, but can be informed—to some degree—by catch patterns that have been exhibited in the catcher-processor sector of the whiting fishery. The catcher-processor sector of the whiting fishery voluntarily formed the Pacific Whiting Conservation Cooperative. This association acts like a rationalized fishery, and clear differences in fishing patterns occurred after the cooperative was formed. It is anticipated that similar fishing practices will occur in the mothership and shorebased sectors of the whiting fishery, though almost certainly not to the same degree.

A model illustrating the potential to reduce the catch rate of overfished species and the associated potential for increased target species catch and revenue

The reduction in the bycatch rate of overfished species is expected to be as one of the principal outcomes of a trawl rationalization plan. One large implication of reductions in the bycatch rate of overfished species is the ability to access more target species and generate higher levels of revenue than under status quo. Under status quo management, fishing opportunities have been reduced to protect overfished species. In some cases, opportunities to catch species that have historically been large targets of the trawl sector have been eliminated because of their relatively high degree of correlation with overfished species (yellowtail and chilipepper rockfish for example). In many cases, those species that are not highly correlated with overfished species have also seen target opportunities reduced. For example, the catch of sablefish (one of the main targets for the trawl sector) has been less than the total trawl allocation by several hundred tons in recent years and this represents a substantial economic loss in exvessel revenue. It is expected that a rationalization program will encourage fishers to operate in a manner that avoids overfished species better than under the command and control type of management that exists in the status quo regime. This expected change in behavior is directly related to the individual accountability aspect of a rationalization program and the fact that there are individual rewards (because of access to target species) that are the result of decreases in the bycatch rate. Some changes in the way fishing opportunities are prosecuted in order to change bycatch rates include changing the location of fishing, changing the gear that is used to prosecute those activities, and changing the time of fishing.

<u>Non-whiting fishery bycatch</u>

Several sources of information exist that can be used to show how the bycatch rate of overfished species can change in a rationalized fishery and the implications of that bycatch rate reduction. This information can be used to modify the NMFS/GMT trawl bycatch model[7] which predicts overfished species catch, target species catch, and exvessel revenue given an estimated overfished species bycatch rate and a set of assumed exvessel prices. By modifying the bycatch rate the model can be used to simulate potential changes in harvest outcomes that will occur in a rationalized fishery.

[7] The Trawl Bycatch Model was originally developed by staff at the Northwest Fisheries Science Center for use in setting regulations that manage the non-whiting trawl fishery. This model was reviewed and endorsed by the SSC in 2003.

The Washington Arrowtooth Flounder EFP occurred over 4 years with requirements nearly identical to what would be expected under a rationalized fishery. In this EFP, vessels carried observers and were given an overall cap on the amount of overfished species. Vessels were also given individual vessel limits on overfished species. Vessels that could avoid overfished species and stay within their limits had access to arrowtooth flounder and petrale sole in excess of the normal 2-month limits that were in place and had access to areas within the trawl Rockfish Conservation Area (RCA). When a vessel reached or exceeded the individual cap, that vessel was no longer allowed to participate in the EFP and was required to fish under normal two-month limits and RCA restrictions while still carrying an EFP observer. In other words, observations were collected while fishing under the EFP and while the vessel was fishing under status quo regulations (the latter serves as the control in the experiment). In addition to information collected on overfished species and target species catch, information on non-marketable discards was collected during the first year of the program. This information can be used to show order of magnitude estimates regarding the amount of regulatory discard occurring under stats quo management and the increased amount of revenue that can be attributed to the fishery via an elimination of regulatory discards.

The figure below illustrates the recorded canary bycatch rates for vessels participating in the EFP by year. It shows the bycatch rate when those vessels were participating in the EFP and the bycatch rate when those vessels were fishing under normal (non-EFP) fishing conditions. As is shown from the figure, EFP activity resulted in a lower bycatch rate in all years. This information is described in more detail in Appendix C.

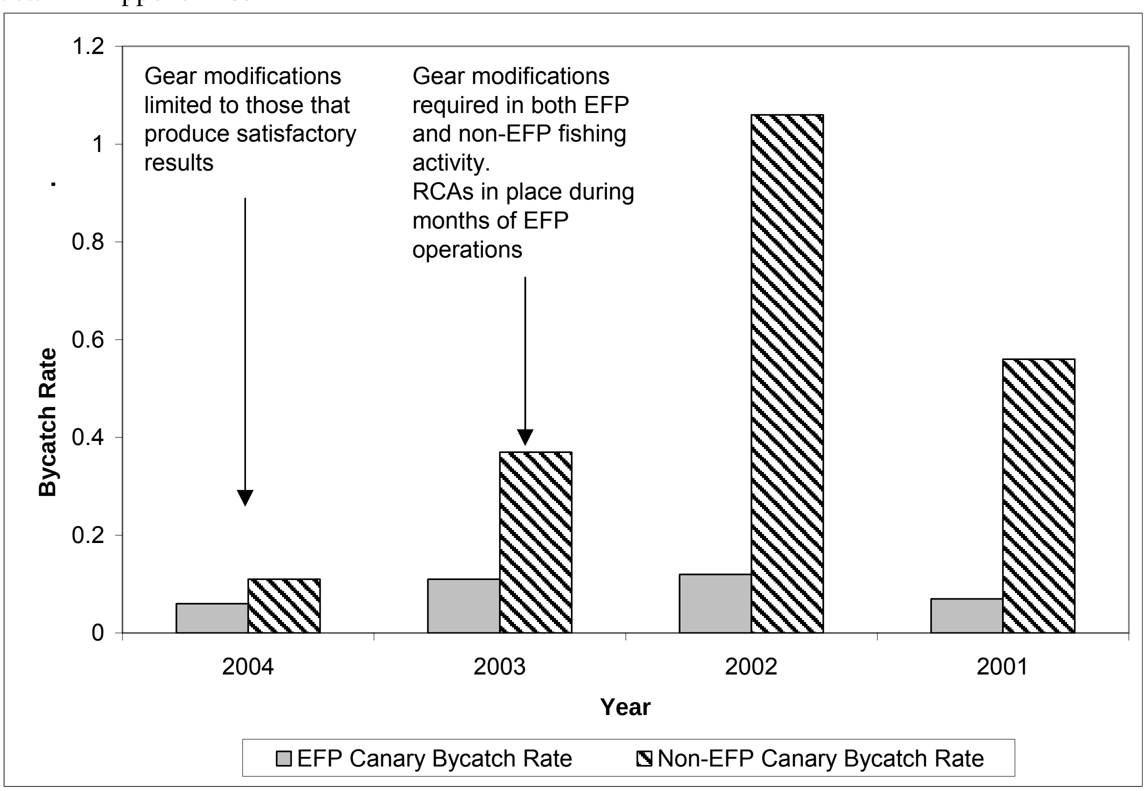


Figure 4–2. Observed canary bycatch rates in the Washington Arrowtooth EFP.

The data from the Arrowtooth EFP project is used to develop a set of overfished species bycatch rates that may occur in a rationalized fishery. These bycatch rates are used in the GMT/NMFS trawl bycatch model to simulate potential harvest outcomes in a rationalized fishery. For more information on this methodology, the reader is referred to the appendix describing the analytical tools.

Pacific whiting fishery bycatch

It is likely that overfished species bycatch rates will also change in the mothership and shorebased sectors of the whiting fishery because those fisheries are operating as an Olympic fishery under status quo management. The whiting fishery operates under sector-wide bycatch limits that can close all sectors of the fishery if reached. Each sector has demonstrated a reduction in bycatch rates since bycatch limits were put in place, however, the catcher-processor sector has demonstrated a lower rate of canary rockfish bycatch (the species that was most constraining from 2004–06). By examining the bycatch rates in the catcher-processor sector, we can infer whether changes in the bycatch rates in the mothership and shorebased sectors of the whiting fishery will occur if those sectors of the fishery are rationalized. It is important to note that it is not appropriate to assume the mothership and shorebased sectors of the whiting fishery would have the same bycatch rates as the catcher-processor sector.

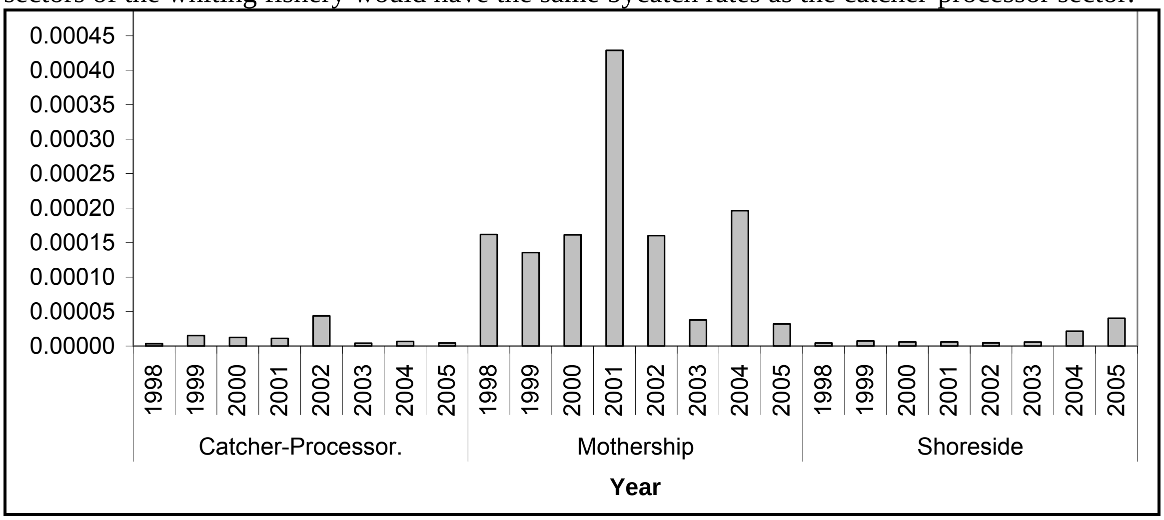


Figure 4–3. Canary bycatch rate by year and whiting sector.

A model describing the impact on the California current ecosystem resulting from changes in fishing behavior and catch

Certain behavioural changes on the part of fishers can be anticipated after a rationalization program goes into place. These behavioural changes can have biological and ecosystem effects and these effects can be identified based on known relationships in the ecosystem. In a rationalized fishery it is anticipated that there will be geographic shifts in effort and greater utilization of currently under-utilized species will occur. Geographic shifts in effort have the potential to alter impacts on habitat, and greater removals of some groundfish can have secondary impacts on other groundfish depending on the trophic level of that species. For example, if arrowtooth flounder is a predator of a certain rockfish and arrowtooth removals increase under rationalization, we would expect the abundance of that rockfish species to increase.

This model uses the anticipated changes in fishing behaviour and catch that will occur after a rationalized fishery goes into place. The source of this information are the catch and geographic shift models described above. We couple possible catch scenarios under a rationalized fishery with an Atlantis ecosystem model for the U.S. West Coast {Brand et al. 2007, Kaplan and Levin 2007}. The ecosystem model includes the full food web, oceanography, and fisheries. The goal is to determine what indirect effects, primarily through predator/prey tradeoffs, are possible under the catch scenarios. The modeling includes the direct effects of fishing (catch and fishing mortality), but in reporting the results we focus more on indirect effects. Direct effects of fishing are most accurately captured in projections from single species stock assessments. For more description of this model, the reader is referred to Appendix C.

A regional input-output model that measures the regional economic impact of changes in catch and revenue occurring in a rationalized fishery

Regional economic modeling addresses the linkages that exist within a local economy. These linkages include outputs from one sector being used as inputs into another sector and expenditures by one sector on labor being a source of household income, which then make personal consumption expenditures from different sectors. Regional economies are not just individual independent entities; they are an interconnected system of entities that are dependent on one another. Modeling this economic relationship requires knowledge of the flow of resources (most commonly measured in dollars) through the economy. As new revenue cycles through the local economy, it powers the local economic engine. In this way, when new money is injected into a local economy, income and consumption rise by an amount that is greater than the amount initially injected because the money circulates multiple times. Modeling how money enters and cycles through the local economy before being spent outside the region is the goal of regional input-output models.

The input-output model developed for the rationalization analysis is fundamentally a fisheries specific input-output model where 19 highly customized unique harvesting sectors that produce 32 unique species/gear outputs are incorporated into a customized IMPLAN regional input-output model[8]. The specific methodology employed to develop this model is modified from the Northeast Fisheries Science Center's Northeast Region Commercial Fishing Input-Output Model developed by Scott Steinback and Eric Thunberg. This model differs from the current Fisheries Economic Assessment Model (FEAM) that has been historically used in west coast fisheries analysis.

The result of this input-output model shows the amount of overall economic activity that occurs as a result of fishing activity. One expected change in the fishery as a result of rationalization is a change in the magnitude and type of species caught. This input-output model is used to show the amount of economic activity that is associated with those landings.

4.2.2 Utilization of Analytical Methods in Assessing the Effects of the Analytical Scenarios

Each of the methods is used to illustrate the impact of the analytical scenarios on portions of the affected environment. In some instances these methods can provide quantitative outputs that differ between each of the analytical scenarios, while in other cases the models may provide a range of likely outputs that are not necessarily tied to a specific analytical scenario. In this case, the relationship of the outputs to the analytical scenarios is characterized based on a qualitative likelihood of where each scenario may fall within that range.

Several analytical methods described are closely related to one another. Some of these analytical methods are related because one measures the direct effect of trawl rationalization while another measures the indirect effect and therefore relies on the outputs of the model estimating the direct effect. For example, this occurs when rationalization changes the way catcher vessels prosecute the fishery and this has a indirect, or second-order, impact on the biological status of fish stocks and on the state of the California current ecosystem.

8 IMPLAN stands for "Impact Analysis for Planning." IMPLAN is an economic impact assessment software program.

The following table illustrates the relationship of the analytical methods to the analytical scenarios and their utilization in determining their respective impact on each of the environmental components.

Data Collection/ Model	Env. Component Informed by Data/Model	Utilization of Information in the Assessment of Analytical Scenarios
Processor Plant and Company Info	• Processors • Communities	Primarily used as descriptive information and as supporting information within various analyses.
Community Infrastructure	• Communities • Catcher vessels	Primarily used as descriptive information and as information within various analyses.
Lessons Learned	• All environmental components	Provides empirical examples of impacts where alternatives under consideration have been implemented in other areas.
Community Vulnerability	• Communities	Identifies communities that are vulnerable and dependent on fishing. Analytical scenarios are assessed based on the likelihood of impacting communities and whether those communities are vulnerable or not vulnerable.
Tracking and Monitoring Program and Cost	• Agencies • Catcher Vessels	Analytical scenarios are assessed based on the amount of consolidation allowed or expected to occur and the associated cost of monitoring that fleet size.
Initial Allocation of IQ	• Communities • Processors • Catcher Vessels	Illustrates the distribution of initial allocation and the implications of doing so at the vessel, processor, and community level. Analytical scenarios are assessed based on the initial allocation rules specified in those scenarios.
Fleet Consolidation	• Communities • Processors • Catcher Vessels • Agencies • Captain & Crew • Input Suppliers	Fleet consolidation is illustrated based on model projections and the amount of accumulation limits that are specified as part of each scenario.
Geographic Fishing Patterns	• Groundfish Resources • Non-trawl Harvesters • Ecosystem • Groundfish	Identification of geographic shifts in fishing patterns is assessed based on the incentives within each analytical scenario for doing so.
Change in Bycatch Rate, Catch, and Revenue	• Catcher Vessels • Processors & Labor • Captain and Crew • Groundfish Resources • California Current Ecosystem	Changes in catch and revenue are portrayed as a likely range. Analytical scenarios are analyzed based on the likelihood of whether each scenario would tend toward the lower or upper bound. The impact on components of the environment are estimated through the impact of the upper and lower bound.
Regional Comparative Advantage	• Communities • Processors • Ecosystem	Elements within the alternatives may mitigate the comparative advantage of some regions. The number mitigating factors in each analytical scenario are used to characterize the outputs of this model in terms of the likelihood that comparative advantage will make a region better or worse off under rationalization.
NWFSC Input-Output Model	• Communities	Outputs from the change in catch and revenue model will be used as inputs in this model. The output of the I-O model will be used to show the regional economic impact of the scenarios.

4.3 Expected Effects of Rationalizing the West Coast Trawl Fishery

FORTHCOMING. TO BE COMPLETED AFTER ENVIRONMENTAL COMPONENT SECTIONS ARE COMPLETE.

4.4 Description of Rationalization Programs and Implications for the West Coast Trawl Fishery

4.4.1 Overview

In this section we draw heavily on available literature to describe the reasons for implementing rationalization programs in other fisheries, their effects, and the likely implications of rationalization for the west coast trawl fishery. Several sources were used in this review including: *Sharing the Fish* and *The Drama of the Commons* by the National Research Council; various Environmental Impact Statements from the National Marine Fisheries Service – Alaska Regional Office; documents produced by the staff of the North Pacific Fishery Management Council; documents produced by the staff of the South Atlantic Fishery Management Council; and informal discussions with experts familiar with programs in New Zealand, British Columbia, and Iceland.

Rationalization of a fishery can be generally described as a program that grants harvest privileges to fishery participants in a manner that resembles the granting of a private property right. While the Magnuson-Stevens Fishery Conservation and Management Act clearly states that such privileges are not property rights, the successful implementation of a rationalization program relies heavily on fishery participants operating as if their quota shares are similar to property rights.

The definition of property rights applies to rights of ownership that include the right of the owner to dispense with the property, the right to use or to not use the property, the right to exclude others, and the right to transfer ownership. Arguably, the most necessary components for successful implementation of rationalization are the aspects of exclusion (that individuals will be held harmless from the actions of others) and the right to transfer ownership.

One principal assumption of a rationalization program is that fishery participants will act as if their behavior does not impact the behavior of another fishery participant and vice versa. The belief that the actions of one harvester cannot impact the actions of another will tend to change the behavior of fishery harvesters from one that is partially based on the actions of other fishery participants, to a set of actions that are largely independent of the actions of other fishery participants. When fish harvesters are acting in a mutually dependent fashion (that is, what each harvester does affects the opportunities of another), the tendency is to engage in competition for catch. This tendency to compete leads to Olympic-style fisheries, economic inefficiency, and safety concerns, among other things. A fishery that operates in this manner is often called an “irrational” fishery, though participants are operating exactly as should be expected, given the incentives presented to them.

A system that administers fishing privileges that are defensible from the actions of others will tend to limit the impact that the actions of one individual harvester can have on another. Under this framework, harvesters will engage in behavior that is in their own economic interest and they will adjust their behavior in a manner that generates a more optimal amount of net revenue. Empirical evidence has shown that this change in behavior on the part of individual harvesters results in less intensive fishing, an extension of harvest timing, and less capital involved in harvesting the stock, among other things. A fishery with harvesters operating in this manner is often called a “rationalized” fishery.

Two models for rationalization are being considered for the west coast trawl fishery: 1) IFQs and 2) Harvest cooperatives. Both systems are intended to create conditions where harvesters believe that the actions of others will have limited effects on them. Administration of IFQs will tend to rely on Federal efforts to monitor and enforce the harvests of individuals, and in this way protects the interests of parties involved in fish harvesting. A system of harvest cooperatives relies heavily on the creation of private/civil contracts between fish harvesters that establish agreements and policies—in a private setting—for harvesting the fish that is available to that cooperative. The bylaws and agreements established in that private contract define the harvesting opportunities of individual vessels (and the penalties for exceeding those opportunities), and in that way establish the conditions necessary for those harvesters to act "rationally." Enforcement of these bylaws and contracts is typically not enforced by the Federal executive.[9] The role of the NMFS is largely limited to monitoring catch levels at an aggregate level (which may be the fishery, sector, or co-op level) and closing when an aggregate catch limit has been met.

Harvest cooperatives and IFQs have many similarities, and in this way are likely to affect the west coast trawl fishery in a similar manner. Arguably, the largest drivers for the impact of the type of rationalization being considered on the west coast are the incentives created through the right of exclusion, the implementation of individual accountability for total catch, and the transferability mechanisms in such programs. These measures tend to create flexibility, enhance both rewards and penalties for individual actions, and establish a different set of incentives for fish harvesters compared to status quo management, altering the state of the socioeconomic environment and changing the manner in which fisheries are prosecuted. This change in the way fisheries are prosecuted will have corollary impacts on the natural environment that can—in many instances—be well anticipated. This section describes the broad-level effects expected to occur on various social and environmental components from the rationalization of the limited entry trawl fishery.

4.4.2 A Review of Impacts in Other Rationalization Programs

Before considering the effects of rationalization on the west coast fishery, it is useful to review the type of effects seen in other rationalization programs, the motivations for implementing those programs, and the reasons why some effects occurred. In many cases, the focus of rationalization programs has been on ending the problems associated with Olympic, or derby-style fisheries. The National Research Council (NRC) {National Research Council, 1999} identified three general motivations for implementing rationalization programs: improving economic efficiency, improving conservation by creating incentives to reduce bycatch and lost gear, and improving safety.[10] The underlying problems are often the result of derby fisheries where the incentives focus on catch maximization and competition, which results in overcapitalization, gear loss, fishing in hazardous conditions, and fishing more intensively than necessary among other things.

Rationalization programs have resulted in some substantial changes in the structure of fisheries around the world. Many impacts of rationalization have been documented in fisheries that converted from a derby system to a rationalization system. A change in the management system of this magnitude dramatically alters the incentives faced by fishermen, and the outcomes of rationalization are often driven by the fact that fishers switch from the objective of catch maximization with little or no individual accountability for catch, to an objective of profit maximization with a high level of individual accountability. Such changes often mean a reduction in the catch of non-target, non-marketable, or prohibited species (because sorting and discarding is time consuming and costly), a reduction in safety-

9 If disputes arise, cooperative contracts may be adjudicated in the courts.

10 The Pacific Fishery Management Council has identified goals, objectives, and guiding principles for rationalization of the west coast trawl fishery that generally include these motivations as well as others.

related incidents (because fishers no longer feel the need to compete and to fish in undesirable conditions), and an increased probability that overall allowable catch levels will not be exceeded (because fishers have individual catch limits).

Several outcomes of rationalization have been documented consistently in the literature. These outcomes have included a reduction in the number of vessels engaged in the fishery, increased probability of staying within allowable catch levels, an increase in the length of the fishing season, an increase in exvessel prices and revenue, and a decrease in harvest-sector employment. From an anecdotal perspective, other impacts have occurred, including a reduction in safety-related incidents and a change in bargaining power between harvesters and processors. While most of these outcomes are social and economic, biological and ecosystem impacts also occur, but typically as a second order effect. Behavioral changes resulting from rationalization can change the level of fishing intensity, type and amount of gear used to harvest fish, and removals of fish species (either in quantity or in type). These changes can impact the ecosystem by way of habitat impacts (by way of changes in gear and effort) and trophic interactions (by way of changes in the quantity and type of fish removals). Biological impacts also occur via changes in the type of fish harvested and the quantity of fish mortality.

In addition to the fact that overfishing of fish stocks is typically eliminated under rationalization, some anecdotal evidence supports the concept that environmental benefits of rationalization programs exist through the “stewardship effect.” The stewardship effect is an argument that has been made routinely as one mechanism that decreases the environmental impact of fishing in a rationalized fishery. The argument for this effect is that through the granting of long-term privileges to harvest a share of fishery resources, fishermen will begin to act like share-holders of a company and be interested in the long-term sustainability of the fishery resource because it is in their interest to do so. This perspective on the part of fishermen results in voluntary measures that minimize the negative environmental impacts that may be caused by fishing and increases the sustainability of the fishery.[11] The National Research Council {National Research Council, 1999} explicitly addressed this argument and makes reference to other incentives created by rationalization including the incentive to high-grade (to target and retain large fecund fish while discarding small fish) and to misreport catches. If these incentives are greater for participants in the fishery than the incentive to minimize environmental impacts, then the rationale for engaging in voluntary behavior to encourage sustainability may not exist. The incentive to engage in misreporting and the targeting of valuable large fish can be overcome through highly effective monitoring, robust enforcement, and a high degree of scientific research and understanding. Effective monitoring and enforcement would tend to overcome the incentive to misreport catches. If effective monitoring is applied to a catch-based system, this should reduce the incentive to high-grade and discard. A high degree of scientific research and understanding would tend to discourage the targeting of large fecund fish if there are negative repercussions to do so and the repercussions of doing so are clear. In other words, if a rationalization program is constructed with long-term fishing privileges, adequate monitoring of catch, robust enforcement, and a high degree of scientific research and understanding on the part of fishery participants, the stewardship effect might exist. It is important to note that the fundamental source of this effect is long term economic self-interest. Aligning economic interests with desired environmental outcomes can be achieved, but several necessary conditions for such an alignment appear to be implied including; that economic interests in the fishery be long term, that quota holders clearly understand the science, that quota holders are actively engaged in harvesting, and that quota holders be able to collectively agree on which voluntary measures to take. On this latter

[11] One important element of this hypothesis that relates to the west coast fishery is that future economic returns create the incentive for fishermen to behave as good stewards of the resource. In a mixed stock fishery such as the west coast groundfish fishery, non-target species may not to receive the same level of stewardship because they do not necessarily provide economic benefit (revenue). In other words, if the stewardship effect exists, it may be more relevant for target species rather than non-target species.

point, if one quota holder elects not to fish an area where fecund rockfish are found, but another quota holder does fish that area, that voluntary measure from the first fisherman is not likely to have any environmental effect. Only if both quota holders elect not to fish on fecund rockfish will there be an environmental benefit.

Although there are several perceived benefits of rationalization, like those mentioned above, those benefits are often associated with some outcomes that are perceived as being negative. Fleet consolidation can be one drawback of rationalization. A reduction in the number of fishery participants often leads to fewer jobs for crewmembers, a reduction in the demand for fishery support business and infrastructure, and an overall net loss of fishery-based economic activity in a community. These effects can be substantial in communities if those communities rely heavily on fishing as a source of economic activity and community identity. In many cases these implications are not homogeneous, meaning they can be more pronounced in some communities than others. These perceived drawbacks have often been one of the reasons for adopting provisions into a rationalization program that limit the amount of consolidation expected to occur, or that otherwise mitigate against some of the perceived negative implications of rationalization. In addition to community effects, other outcomes have occurred that are perceived as being negative. In some fisheries, discards have increased as a result of rationalization because fishers engaged in high-grading. This can be explained in part because some rationalization programs have not held individuals accountable for discard that occurs in the fishery. Systems based on total catch (landings and discard) with adequate monitoring have typically shown reductions in discard.

4.4.2.1 *Case Studies and Lessons Learned*

The 1999 National Research Council study (National Research Council 1999) reviewed economic and social outcomes of U.S. ITQ programs on communities. The ITQ programs and their effects on communities are summarized below. Unless otherwise noted, all data comes from the NRC report; in addition, two general reviews of quota programs (GSGislason & Associates Ltd.. 2008; Redstone Strategy Group and Environmental Defense 2007) are summarized last. Unfortunately, detailed data on community impacts is often missing; as the GAO noted (2004:23-29):

> Fishery managers have not conducted comprehensive evaluations of how IFQ programs protect communities or facilitate new entry, because few IFQ programs were designed with community protection or new entry as objectives. This lack of information, combined with the concerns about economic efficiency and fairness, makes it more difficult to decide which community protection and new entry methods to use …Without collecting and analyzing data on the effectiveness of the approaches used, fishery councils will not know if the program is meeting its intended goals and if mid-course adjustments need to be made.

Surf clam/ocean quahog fishery

This mid-Atlantic and New England fishery was the first in the U.S. to be managed under ITQs, beginning in 1990. It is managed by the Mid-Atlantic Fishery Management Council (MAFMC). Prior to ITQs, the fishery was managed through size limits, annual and quarterly quotas, and (for surf clams) fishing time restrictions intended to even out product input to processors. A moratorium on new entrants into the fishery began in 1977, allowing 140 permitted vessels. The moratorium was considered a success, reducing overharvest of surf clams and fostering development of the quahog fishery. However, the regulatory system was costly and difficult to enforce, and the rules restricting fishing time led to unused fishing capacity and health and safety problems resulting from fishermen feeling they had to fish in bad weather. Cheating was alleged to have been rampant, and financial institutions were reluctant to support fishing ventures.

The ITQ program put in place in 1990 has two components: transferable quota shares (a percentage of the TAC) and "allocation permits," or cage tags, that are valid and can be transferred only within a calendar year. The initial allocation was to owners of permitted vessels that had harvested surf clams or ocean quahogs between 1970 and 1988. Different formulas were used in different regions, and according to McCay et al. (1995:96), the initial allocation came close to status quo, although some smaller holders found themselves with non-viable levels of quota. There is no accumulation limit or maximum holding; planners argued that U.S. antitrust laws could be invoked to constrain monopolies (McCay et al. 1995). Anyone qualified to own a fishing vessel under U.S. law may purchase ITQs.

McCay et al. (1995:98) notes that two sources of conflict over the initial allocation. First, some fishery interests who were marginally involved in the fishery ended up with low allocations. Second, a small, distinct fishery for inshore ocean quahogs in the Gulf of Maine was "discovered" post-implementation. No one in the fishery had recorded individual landings, and thus could not quality for ITQs. Each vessel would thus have to purchase ITQ from others in the fishery. Managers resolved the situation temporarily by treating the Maine fishery as an experimental fishery.

TACs have not been exceeded since implementation of the ITQ program. As a result of the program, the MAFMC suspended the minimum size limit on surf clams, and discard of small clams has decreased. The number of vessels active in the surf clam fishery went from 128 in 1990 to 33 in 1997, a 74 percent reduction. In the ocean quahog fishery, active vessels went from 52 in 1990 to 31 in 1997. (It should be noted that the vessels involved are rarely used for any other fishery). McCay et al. (1995) estimated a one-third decline in labor in the Atlantic surf clam and ocean quahog fishery between 1990 (when rationalization was implemented) and 1992.

Economic efficiency in the fishery has increased, and excess harvest capacity has declined, since the introduction of ITQs. Some small, resilient firms purchased more quota shares, while many other small firms sold out in the first two years after implementation. Medium-sized firms were most likely to purchase more quota shares, while the largest firms remained "essentially constant in their holdings" (1999:65). Many participants stopped fishing and leased their quota shares to other firms. For ocean quahogs, ownership became increasingly concentrated, but it did not change significantly for surf clams. Monopolization does not appear to have occurred in either fishery, but after implementation, a few buyer-processors became dominant, and the processing sector began moving to southern New England. There has also been a northward shift in landings, due in part to declining CPUE in the southern region and due to the shift in processing. Reliance on a single buyer increased the likelihood of exiting the fishery by the end of 1993.

In communities, employment in the clam industry declined due to the reduction in vessels and a decline in the bargaining power of crew and captains, "symbolized and to some degree exacerbated by changes in the share system of returns to owners and crew" (1999:65). No research on community impacts has been done. Although improved safety was a justification for the ITQ program, between 1990 and 1999 nine clam boats and fourteen lives were lost, comparable to the 1980s. The role of ITQs in mitigating or enhancing the danger of the fishery is unknown.

Brandt (2005), studying the rationalization of this fishery, found that many small-scale fishermen transitioned to a new business model based on leasing ITQs to other harvesters. The firm-level analysis (as opposed to vessel-level analysis) showed "little evidence that the small-scale harvester was disadvantaged relative to the larger-scale harvester" (2005:16). In addition, Adelaja et al. (1998), in a short-term study conducted in 1993 and 1994, found that monopolies did not develop in the surf clam and ocean quahog fishery.

South Atlantic wreckfish fishery

The fishery for wreckfish (*Polyprion americanus*) takes place in a small area of the South Atlantic region, in deep water, using specialized gear, and for a niche market. The fishery has less than 50 participants and was put under an IFQ program within five years of its inception.

The fishery began in 1987 under the South Atlantic Fishery Management Council (SAFMC). Prior to implementation of the IFQ program in 1992, the fishery was managed through a TAC, trip limits, a permit system, a spawning closure, restricted offloading hours, and a bottom longline restriction. Most vessels participating in the fishery were larger than 50 feet and were used primarily in other fisheries.

Catch in the wreckfish fishery increased from 29,000 pounds in 1987 to more than four million pounds in 1990 (1999: 67). Little was known about the biology of the stock. At the same time, the number of vessels increased from two in 1987 to 80 in 1991. This rapid growth and lack of information, coupled with the shortening of the season and "derby" nature of the fishery, were driving factors in developing an ITQ program.

The goals of the ITQ program were to create incentives for conservation and regulatory compliance by fishermen; to promote stability and facilitate long-range planning and investment; to allow the marketplace to drive harvest strategies and product forms; to minimize gear and area conflicts; to minimize overcapitalization in harvesting, processing, and distribution; and to allow fishermen to make adequate returns by controlling entry. The ITQ program is based on percentage shares in the TAC; initial allocation was restricted to permittees who had landed more than 5,000 pounds of wreckfish in 1989 or 1990. Fifty percent of shares were distributed in proportion to a permittee's landings within a given period, and 50 percent were distributed equally to all eligible permittees. No "single business entity" could receive more than 10 percent of initial shares. However, there was no limit on accumulation.

Since the implementation of the ITQ program, landings have been significantly lower than TAC every year, primarily due to a reduction in fishing trips caused by low market prices. The number of shareholders decreased from 49 in 1992 to 25 in 1996, only eight of whom landed wreckfish in the 1996-1997 season. Most shareholders are engaged in other fisheries. The small ITQ program is much easier to administer, enforce, and monitor than the system in place prior to ITQs.

The relatively small number of participants in the wreckfish fishery come from dispersed communities throughout the South Atlantic region. No single community is significantly dependent on the fishery, so community impacts are difficult to discern. The NRC notes that "presumably some flexibility has been lost for other, non-ITQ fishermen who might wish to fish for the unused portion of the quota. The other perspective is that these fish are being 'banked' by quota holders and they or their offspring could be caught in later years" (1999:69).

Alaska halibut and sablefish fisheries

Fisheries for Pacific halibut and sablefish occur off the coast of the Pacific Northwest, British Columbia, and Alaska. The directed fishery for halibut uses longline gear. The directed fishery for sablefish uses longline and pot gear. Most vessels engaged in these fisheries are catcher vessels, but there are catcher-processors in both fisheries. Most vessels are based in the Pacific Northwest and Alaska.

Problems that led to consideration of an IFQ fishery included allocation conflicts, gear conflicts, ghost fishing, bycatch loss in other fisheries, discard mortality, excess harvesting capacity, problems with product quality, safety issues, and a lack of economic stability in the fishery and communities. In the halibut fishery, the number of participating vessels grew from 1,000 in 1975 to about 3,700 in 1993, with a season length shrinking from 150 days in 1970 to 2 days in the mid-1980s (Knapp 2000). This predominantly small-boat fishery is based in rural, coastal communities. The extremely short season for halibut averaged two to three days per year from 1980 to 1994 in the areas where most of the fish were caught.

The North Pacific Fishery Management Council's goals in developing the ITQ program were to end the derby-style fishery, and costs associated with the "race for fish"; to develop a permanent solution to the problems in the fishery; and to reduce management costs. The Council began considering IFQs in 1988, and implemented the program in 1995. The halibut program applies to all commercial hook-and-line harvests in state and federal waters off Alaska. The sablefish program is limited to longline and pot gear fisheries in federal waters off Alaska. Halibut shares were allocated to 5,484 vessel owners and leaseholders with commercial landings in given years (crew and hired captains did not receive initial allocations). Specific allocations were based on the five best years of landings for each individual during a given time period. Sablefish shares were allocated to 1,094 owners and leaseholders, using a similar formula. In general, IFQ owners are required to be on board the vessel when the IFQ is being fished. Rules on accumulation and transfer are still evolving, but in general there are limits on both, with low accumulation caps (1 percent). Individuals whose initial allocation exceeded the ownership limit were not required to sell the excess quota, but they could not acquire more. Transferability is restricted across vessel sizes and categories.

In addition to accumulation caps and transfer limits, the allocation included an adjustment for implementing the Community Development Quota program in the western Bering Sea region.

As a result of the IFQ program, season length has increased from 5 days to 245 days per year for both species, and landings are broadly distributed throughout the season. It is unclear how costs and revenues have been affected. A lack of studies and data makes it impossible to determine the net economic impact of the program. The top five halibut ports and top sablefish ports have remained the same. The quota share market has been active, with more than 3800 transfers in the halibut fishery and 1100 in the sablefish fishery. This has led to some consolidation, with the number of quota holders declining by 24 percent in halibut and 18 percent in sablefish between 1995 and 1997. In both fisheries, most consolidation has taken place among smaller holders. There is anecdotal evidence that fishermen have reduced crew size and that shareholders are crewing for each other, but lack of data makes it difficult to determine effects on crew.

The NRC study offers little data about community impacts. Low prices for salmon have made halibut and sablefish catches more important for regional economies. There is some dissatisfaction about the exclusion of crew members and processors from the initial allocation; crew members and processors felt the initial allocation rewarded vessel owners and changed market power in favor of shareholders. There is also dissatisfaction about the delay between the qualifying years and the implementation of the program, which resulted in excluding some fishermen who were active immediately prior to implementation. In addition, there are ongoing concerns about enforcement and community impacts.

Knapp (1999) found that in general, Alaska fishermen felt that the rationalization program had made fishing for halibut safer. However, in a 2000 study, he noted that fishermen were sharply divided in their attitudes about the program, but that attitudes are becoming more favorable over time as those with negative attitudes are leaving the fishery. Not surprisingly, attitudes towards IFQ management were correlated with initial allocations of quota.

Iceland's ITQ program

The highly productive waters around Iceland have hosted a flourishing fishing industry for several hundred years. Iceland began an ambitious vessel construction program in the 1970s that rapidly expanded with the displacement of foreign fleets and the establishment of Iceland's EEZ. This was quickly followed by overcapacity of the fleet and overexploitation of Icelandic fish stocks, particularly cod. Beginning in 1977, attempts were made to limit the size of the fishing fleet, but the value continued to increase by 2.6 percent annually, and the TAC for cod was consistently exceeded. A desire to improve conservation and efficiency while improving safety and simplifying administration led to the development of ITQ programs in the 1970s and 1980s. At first, the program was seen as a temporary emergency measure, but in 1990, most stocks around Iceland were incorporated into a quota management system.

When cod was put under an ITQ program in 1984, access was given to those who were boat owners when the system was introduced, primarily based on their fishing record during the preceding three years (Palsson and Helgason 1995). Each fishing vessel over 10 tons was allotted a fixed proportion of future TACs of cod and five other demersal fish species. New vessels could only enter the fisheries if one or more existing vessels equivalent in size were eliminated in return.

Quota allocations are of indefinite duration and can be revoked at any time. In order to be eligible to hold quota, a person or company must have access to a vessel to which the quota is allocated. Quota shares can now be leased or permanently sold, but to retain their quota allocations, holders must fish at least half of their quotas every second year. Twenty percent of a year's groundfish quota can be shifted to the next year, and an overage of five percent is permitted in any year without penalty.

If a quota is leased or sold to a vessel operating from a different place, the consent of the municipal government and the local fishermen's union is required. However, trading of quotas is brisk.

The government set up a new agency to issue permits and quota shares, to collect data, and to conduct monitoring and enforcement. Management of herring has been very successful, but management of cod has not, possibly due to an excessive TAC. Overruns of the cod TAC resulted because of fisheries that were exempted from the quota program, and possibly because of discards of small and immature fish. However, the ITQ program seems to have improved the profitability of the fishery considerably, with large increases in quota price. The total productivity of capital and labor in the fishing industry increased by 67 percent between 1973 and 1990, despite less plentiful fish stocks. In the herring fishery, the number of vessels decreased from more than 200 vessels in 1980 to 29 in 1996, while the total catch increased from 53,000 mt in 1980 to 140,000 mt in 1994-1995. In general, there has been a trend toward fewer and larger vessels. The Icelandic government implemented a buyback program in 1994 to remove vessels from the fishery, suggesting the problem of overcapacity was not solved completely by rationalization.

The Icelandic economy is heavily dependent on fisheries; in 1996, about 73 percent of the value of goods exported from Iceland consisted of fish and fish products. In 1995, about 11 percent of the population was employed in fishing and fish processing. Fishing is a dominant industry in towns and villages throughout the island.

As of 1999, 24 large firms owned almost half the total quota, and the share of the largest quota holder was six percent. Some companies sold their quota to companies located elsewhere, and when TACs are decreased, some quota holders sell out because their share is no longer viable. Palsson and Helgason (1995:142) found that "many of the smaller operators that still hold ITQs are increasingly entering into contracts with larger ITQ holders—'fishing for others'—arrangements that are profitable for the lessors but entail a significant loss of profits for the lessee boat owners and a reduction in the wages of their crews."

The increasing concentration of fishing quota in the hands of large companies has had devastating effects on small fishing communities, leading to unemployment and eroding the tax base. Small communities with fewer than 500 inhabitants have lost a much larger share of quota than larger communities. In some cases, they have tried to reduce the decline by buying or leasing quota or investing in local firms.

There is considerable dissatisfaction about the initial allocation of quota only to vessel owners. The NRC notes that "prior to the program, fishing was typically regarded as a 'co-venture' of vessel owners and crews and many crew members now feel disenfranchised" (1999:86). Fishermen are concerned about "the emergence of the relations of dependency associated with 'fishing for others,' prompting at least three strikes by fishermen in the past five years" (1999: 87). Palsson and Helgason (1995:118) found that fishing rights were increasingly concentrated in the hands of the biggest companies and that "public discontent with the concentration of ITQs and the ensuing social repercussions of this process are increasingly articulated in terms of feudal metaphors, including 'tenancy' and 'lords of the sea.'" In addition, there is concern about the concentration of ITQs in the hands of large vertically-integrated companies, and resistance to profit-oriented exchange of fishing rights. The bureaucracy associated with fishery management has not been significantly reduced, and there is concern about municipal bankruptcy in fishing villages that have lost most or all of their quota, with massive unemployment and dissolution of communities.

New Zealand's ITQ program

New Zealand's ITQ program began in 1986, in response to overcapitalization, decreasing productivity, declining economic performance and excessive management intervention. The aims of the ITQ program were to rebuild fish stocks; ensure that catches would be limited to sustainable levels; ensure that catches would be harvested efficiently, with maximum benefits to fishermen and the nation; allocate catches equitably; manage the fishery to allow security and flexibility; integrate the ITQ programs of the deepwater and inshore fisheries; develop a regional management framework; restructure the harvesting sector; and enhance the recreational fishery.

Quota was allocated among fishermen based on catch history during a two-year qualifying period. Ten fishery management areas were set up, with TACs established for each area (Dewees 1998). Thirty species were covered. The initial allocation was made free of charge; ITQs were allocated in perpetuity and authorized holders to take specific quantities of each species annually in each quota area (as opposed to a percentage of the TAC). In 1990, this was changed to a proportional ITQ system in order to reduce the need for government intervention in order to adjust the TAC (Dewees 1998). Accumulation limits were set in the 20-35 percent range. ITQs may not be held by non-residents of New Zealand or by companies with overseas control. They are transferable.

Several developments not directly related to rationalization took place in New Zealand during the same period, making this example difficult to compare to the current West Coast process. For example, an extremely valuable snapper fishery underwent significant declines in TAC, and attempts were being made to allocate 40% of the commercial catch to the recreational sector. At the same time, there was a trend toward "New Zealandization" of the fishing industry, with more harvesting and processing taking place in New Zealand. Catches of some species increased by 40% during this period. In addition, settlement of native Maori claims reduced the quota holdings of several large vertically integrated companies. As of 1998, Maori interests owned or leased approximately 40% of the New Zealand quota (Dewees 1998).

Several conservation measures were included in the program. The ability to carry forward overages to the next year was abolished, and a more precautionary approach to setting TACs was adopted (Dewees 1998).

The ITQ program resulted in improved biological status of fish stocks and the development of an open, transparent stock assessment and TAC-setting process. The goals of reduced overcapitalization, increased flexibility, market orientation, greater industry responsibility, and increased efficiency and profitability were achieved. Dewees (1998:S135) notes that "five of the six vertically integrated companies in the 1995 interviews had very positive responses to the ITQ system. These companies stated that their firms' relatively secure fish supplies resulting from the ITQ system enabled them to do long-term planning and value-added product development. The small-scale quota owners interviewed had mixed feelings." No details were available about impacts on communities.

British Columbia halibut quota program

Wilen and Casey (1997) reviewed impacts on crew from the British Columbia halibut longline quota program. Prior to rationalization, the B.C. halibut fishery was a classic "derby" fishery with very short seasons (4-5 days), similar to the Alaska halibut fishery prior to rationalization. A limited entry program was adopted in 1979, restricting participation to 435 vessels, which subsequently became the core group of quota holders under the rationalization program. Rationalization was implemented in 1991.

The allocation formula was derived by the industry, based on prior catch records (70 percent) and vessel length (30 percent). An observer company was hired and funded with a self-imposed landings tax. During the first two years, quotas could not be transferred permanently or leased. In 1993, leasing was allowed, but consolidation was limited. Each vessel's allocation could be split into two equal units which quota holders could lease out. Quota holders could lease up to two units from others. This effectively constrained "quota stacking," and Dewees (1998:S136) notes that "this gradual transition to transferability also allowed fishery participants time to adjust to the new system and think through their participation decisions."

The rationalization program resulted in some important changes in product handling and quality. The halibut season became longer (eight months), allowing halibut to be sold fresh, as opposed to frozen. During the first year, the percent of the harvest marketed fresh jumped from about 40 percent to 94 percent, generating 55 percent more in exvessel prices. The Department of Fisheries and Oceans instituted a hotline where fishermen could find out how many others were fishing, in order to time trips so that the fresh market was not periodically glutted. In addition, fishing was reduced during the Alaska halibut season.

Wilen and Casey (1997) found that some consolidation had taken place, but that it had been limited by the program's design. Dewees (1998:S136) reported "a transfer of market share from large traditional processing firms to smaller firms specializing in halibut. The number of firms processing halibut increased from 57 to 69 and the locations of landings became less concentrated." Most vessels continued to fish for other species such as groundfish, salmon, and herring, and after rationalization they did not fish substantially longer than before. The rate of fishing slowed dramatically compared to the pre-rationalization derby fishery. The average number of days at sea per trip declined, but there was a slight increase in the number of trips per season.

At the same time, both the importance of the specialized skills that crew members contributed during the derby fishery, and the need for additional crew to reduce risk during the derby setting, declined. Crew size per vessel was reduced, usually by one person, among 44 percent of those surveyed. Wilen and Casey (1997) and Dewees (1998) estimated that the quota program reduced the total number of crewmembers employed by 32 percent, but that the total days of fishing had increased marginally. Of the 44 percent who reported reducing crew size, 59 percent reported that individual shares for the remaining crew went up. Wilen and Casey report (1997:330) that “remaining crew members are likely to be substantially better off than before even if the individual crew shares have been reduced.”

Bering Sea crab rationalization

Bering Sea crab rationalization began during the 2005/2006 fishing season. Lowe and Knapp (2006) studied the impacts of rationalization on the three small Alaskan communities of False Pass (pop. 40), King Cove (pop. 80), and Akutan (pop. 500). All three communities relied on both commercial and subsistence fisheries. False Pass and Akutan were designated Community Development Quota (CDQ) communities, giving them economic protections lacking in King Cove. Both King Cove and Akutan had fish processing plants owned by major seafood companies.

Although these communities do not closely resemble the communities that will be affected by West Coast trawl rationalization, it is worthwhile to note some of the impacts they experienced from crab rationalization. In the first year of rationalization, dramatic consolidation occurred. Vessel registration declined by about two-thirds for the Bristol Bay Red King Crab fishery and about one-half for the Bering Sea Snow Crab fishery. A corresponding decline in the number of crab fishing jobs occurred, with a loss of about 900 King Crab jobs and 450 Snow Crab jobs. (About 15 percent of this decline was due to a corresponding crab vessel buyback program). The remaining jobs changed, with employees generally working longer seasons and earning more total income. However, the share of exvessel value going to crew declined, because a portion of the exvessel value was used for royalty payments on leased quota. In other words, total crew earnings declined “because the increase in earnings per job has not been sufficient to offset the decline in the number of jobs” (Lowe and Knapp 2006:4).

Rationalization also decreased sales for some support businesses, such as pot storage, welding, marine supplies, hotels and taxis. In general, “processors have benefited from greater certainty of supply but some face higher operating costs from extended operating seasons” (Lowe and Knapp 2006:4).

Lowe and Knapp note (2006:4-6) that “among the most important long-term effects may be changes in the options available to individuals and communities to participate in crab fisheries… The economic viability of the communities has depended upon the ability of residents to participate in multiple local fisheries and to switch between fisheries as resource and market conditions change. Crab rationalization has restricted the ability of residents of these communities to continue to do this in the future.” They note that the effects of crab rationalization will affect, and be affected by, what happens in other fisheries and their management.

Bering Sea Pollock – American Fisheries Act

The American Fisheries Act was signed into law in October of 1998. The purpose of the AFA was to tighten U.S. ownership standards that had been exploited under the Anti-reflagging Act, and to provide the BSAI pollock fleet the opportunity to conduct their fishery in a more rational manner while protecting non-AFA participants in the other fisheries {NPFMC, 2002}. The passage of the AFA resulted in the rationalization of the BSAI Pollock fishery by establishing “harvest cooperatives” for various sectors of the Pollock fishery. This cooperative structure was created with the intention that “both harvesters and processors benefited from rationalization” {Stevens and Gorton, 1999 in Matulich, 2000}. The result of the AFA was a reduction in bycatch, increased utilization, increased economic returns, and improved safety among others. Reports indicate other outcomes as a result of the cooperative structure created through the AFA. The flexibility provided by the cooperative structure allowed the AFA fleet the ability to spread their effort in time and space to accommodate Steller Sea Lion conservation measures, and shifted the monitoring and enforcement burden to the cooperatives and their members {NPFMC, 2002}.

Several negative impacts of the AFA were reported. Those vessels that had recently moved into the fishery were excluded because their years of participation did not match those years necessary to qualify as an AFA vessel. Spill-over of AFA vessels into other fisheries was also reported as AFA vessels had improved opportunity to time operations and therefore participate in additional fisheries. Several fishery participants voiced concerns that being "locked in" to a particular fishery would reduce the flexibility necessary to adapt as the abundance of various fish species increases and declines over time.

Community effects appear to have varied. Community members directly engaged in the Pollock fishery generally benefited through the implementation of the AFA, but some evidence supports the notion that less shoreside infrastructure and support business was utilized in some communities and fishing-related activity became more concentrated in certain ports and less concentrated in others. One particular benefit of the AFA as it relates to small and "vulnerable" communities is that Community Development Quota (CDQ) programs invested in various seafood companies engaged in the Pollock fishery. The Community Development Quota program (CDQ) allocated a percentage of BSAI species to certain eligible communities in western Alaska. The purpose of the CDQ program was to provide villages the opportunity to participate and invest in fisheries, to support economic development, to alleviate poverty and provide economic and social benefits, and to achieve sustainable and diversified economies in western Alaska. Following the passage of the American Fisheries Act, CDQ groups bought in to various seafood companies engaged in Pollock. The accumulation of assets can lead to self-sustaining fishing economies in those CDQ communities.

Summary study of Canadian IFQ programs

In a report prepared for Canada Fisheries and Oceans, GSGislason & Associates (2008) reviewed five Canadian Pacific IFQ fisheries: the halibut longline fishery, the sablefish longline and trap fishery, the groundfish trawl fishery, the geoduck dive fishery, and the red sea urchin dive fishery. They developed ten "lessons learned" that echo many of the more positive lessons presented in the previous case studies (2008:iv-v), summarized here:

1. The situation in many fisheries prior to introducing ITQs was untenable. Change was mandated by poor conservation, business, and people practices.
2. Changes in the economy usually involve the substitution of capital for labor. This is what happened in ITQ fisheries, where each active vessel/operating unit caught more fish—but each ITQ crew members worked much longer and generally earned more money over the season.
3. ITQs create an incentive for fishermen, processors, and buyers to cooperate in identifying market needs and ensuring appropriate catch timing/handling to meet those needs.
4. ITQs allow the production of high value products, building a demand niche that is more insulated from broad supply and demand trends.
5. ITQs have led to better monitoring of port offloads and at-sea activities. ITQs have also led to much better science in most fisheries considered, science for which industry has paid.
6. The long-term benefits of ITQs are generally greater than the short-term benefits, e.g., it takes time for the fleet to consolidate to an economic size, and time for the market to accept new products.
7. ITQs shift the balance of power between the license/vessel owner and the vessel crew and the processor-buyer. The license/vessel owner appropriates a greater share of the increase in "industry value" than does the processor or crew. "We argue, nevertheless, and this study substantiates this, both crew and processor interests are better off in total under ITQs" (2008:v).

8. Certainty of access is a necessary condition to the success of an ITQ program.
9. Commercial fishing licenses under ITQ fisheries management do not necessarily gravitate to interests in large urban centers at the expense of rural interests.
10. It is difficult to analyze the employment, wage, and community impacts of ITQs in isolation of resource conservation, fisheries management, market/revenue, and cost impacts. Future analysis of the employment impacts of ITQ fisheries should be one component in a more broad based review of ITQ programs.

Summary study of U.S. and British Columbia programs

A summary report of U.S. and B.C. limited access privilege programs (LAPPs) (Redstone Strategy Group and Environmental Defense 2007) looked at the impacts of the Mid-Atlantic surf clam/ocean quahog program, British Columbia sablefish, halibut, and groundfish trawl programs, South Atlantic wreckfish program, Alaska halibut, sablefish, pollock, and King Crab programs, and the Pacific whiting co-op program. The study presented five major conclusions:

1. In these fisheries, LAPPs were usually implemented after traditional management had failed.
2. Overall, the fisheries experienced major economic improvements, clear environmental gains, and a mixture of social changes.
3. Compliance with TAC increased, discards decreased, and habitat destruction decreased across the board.
4. Improved fishing practices allowed better management of biomass, ecosystem health, and commercial landings.
5. There were positive and negative social effects.

In regard to community and social impacts, the study found (2007:14) that "positive effects included increased safety and a higher percentage of fishermen employed full time. Negative effects included community, processor, and job losses; private economic gains at public expense; and in some cases increased ownership concentration and consolidation. Generally newer LAPPs addressed these concerns through improved LAPP design." The study further notes (2007:18): "Overall, concentration was often focused in fisheries with significant economies of scale (for example, those requiring large capital investments in vessels or equipment). Nevertheless, it appears that statutory concentration limits have significantly limited fisheries' ownership concentration in fisheries … However, these limits may have also limited the economic potential of consolidation."

4.4.3 A Comparison of Harvest Cooperatives and Individual Fishing Quota Systems and Their Appropriateness to Fishery Characteristics

As discussed above, the Council is considering the implementation of harvest cooperatives and individual fishing quotas as tools for rationalizing the west coast trawl fishery. These programs have many similarities, but they also have many differences. These differences may make one system appropriate for some fisheries and the other system appropriate for another fishery. In order to determine the appropriate institution, it is important to understand these differences.

While harvest co-ops and IFQ systems both explicitly or implicitly grant fishing privileges in the form of the opportunity to catch a share of the allowable catch, the approach for managing the prosecution of fishery resources between the two programs can be quite different. A system of IFQs requires that an agency track and monitor each vessel's catch, that the agency execute quota transfers between vessels or permits, and that the agency enforce the allowable catch levels of individual vessels. A system of harvest cooperatives is essentially a "hands-off" approach on the part of the agency, except that NMFS monitors the catch that occurs, and fishing activities and the enforcement of those activities is primarily done through private contracts within and across the harvest cooperatives themselves.

Harvest cooperatives are organizations made up of vessels that work together to harvest a fishery resource. These organizations are sometimes made up of several vessels that negotiate catch sharing arrangements among themselves without needing agency involvement. In other cases, harvest cooperatives are created by several vessels with catch history assignments that each vessel brings to the cooperative. The vessels typically have the privilege to harvest that share, but can lease all or a portion of that share to another vessel through a private agreement without needing agency involvement. The administration and enforcement of harvest activities among member vessels is primarily done through the cooperative organizations and through private contracts. The regulatory activities of the agency are generally limited to monitoring for sector or co-op catch levels and closing when a sector or co-op reaches the allocation or OY.

An example of a harvest cooperative already exists on the west coast. The Pacific Whiting Conservation Co-op is a voluntary association of catcher-processors that have negotiated catch sharing arrangements among themselves without agency and Council involvement. The necessary ingredient for this cooperative to form is an allocation of whiting to the sector and a barrier to entry by other catcher-processors that are not part of the arrangement. The mothership and shorebased cooperative proposals are similar to the second example described above. In the mothership proposal, each mothership catcher vessel permit would have a share of the sector allocation based on their catch history, and those holding permits for catcher vessels would form cooperative arrangements with other such permit holders. The cooperative organization would coordinate harvest activities of its member vessels and these activities would include leasing of shares between members without agency involvement.

An IFQ program grants the privilege to harvest fishery resources in the form of a percentage of the allowable catch. These shares are granted to individual entities and are privileges to harvest a portion of fishery resources. Quota can be made transferable allowing them to be bought and sold and enforcement and monitoring of individual harvest levels and quota trading is typically done by the management agency.

Arguably the principal difference between the two programs is the coordination of harvest activity. Often vessels in an IFQ program do not coordinate their harvest activity. In a co-op program harvest coordination occurs between members of industry, the government is often not involved to the same degree. This coordination occurs because of the collective nature of the co-op and the collective burden placed upon the co-op to constrain catch by members to the co-op's allocation of the allowable catch. If one vessel acts irresponsibly, the entire cooperative may suffer, and this collective burden fosters communication in order to enhance the success of harvesting.

Co-op programs can take on many characteristics of IFQ programs and vice versa. The justification for the selection of the type and specific design of the program can depend, in large part, on the characteristics of the fishery and fishery participants. In general, the level of similarity among vessels in the fishery, the level of similarity among markets for participants in the fishery, and the number of vessels in a fishery may help determine the appropriate mix of cooperation and independence for a rationalization program. The purest form of a cooperative (one where the government makes no vessel or permit-specific allocations) will most likely have vessels with similar objectives, similar catch histories, similar constraints on their harvesting activity, and a barrier to entry (the catcher-processor sector is one example of this arrangement). Alternatively, the purest form of an IFQ program may have many participants with a wide array of vessel characteristics, markets, catch histories, and regions. As participants in an IFQ program acquire similar objectives, constraints, markets, etc., that fishery may very well take on characteristics that are similar to co-op-type rationalization programs. Alternatively, as participants in a co-op program acquire dissimilar markets, and have variation in the opportunities available, that fishery may very well take on characteristics that are similar to IFQ-type rationalization programs with more numerous and diverse co-ops. In the end, choosing the most appropriate program depends on the characteristics of the fishery and fishery participants.

The appropriate institution (whether it be individually focused through IFQs or collectively focused through co-ops) depends in large part on conditions present in the fishery and whether those conditions foster, or hinder, cooperative behavior, and to what degree. Nine variables have been identified which influence cooperation in commons dilemmas: social motives, gender, payoff structure, uncertainty, power and status, group size, communication, causes, and frames {National Research Council, 2002}. Because of the characteristics of the groundfish fishery and the alternatives under consideration, the variables most applicable in this case are social motives, payoff structure, power and status, group size, and communication.

In theory, social motives are categorized in four orientations: individualism—the motivation to maximize one's own gains, competition—the motivation to maximize relative gains, cooperation—the motivation to maximize joint gain, and altruism—the motivation to maximize other parties' gains. These theories can be categorized into proself motives (individualism and competition) and prosocial motives (cooperation and altruism) {National Research Council, 2002}. Social and psychological research has shown that individuals exhibit different behaviors and preferences depending on which of the two categories they fall into. Proself individuals tend to harvest more of a common pool resource, while prosocial individuals tend to act in a way that achieves a more collective and equitable outcome. Both types of individuals can be said to be behaving "rationally" when engaging in these activities, but their objectives are different. Proself and prosocial perspectives are important when considering whether to implement harvest cooperatives or IFQs in a fishery. Proself fishers may be less likely to operate successfully in a harvest cooperative system than in an IFQ system. In addition, the fact that harvest cooperatives rely on the presence of a "non-co-op fishery" (a derby fishery for participants that are not in a co-op), the successful prosecution of the fishery may depend on non-co-op participants being "prosocial" so that they do not close the co-op portion of the fishery, through a disaster tow for example.

In cases where there are likely to be collective problems in an IFQ program (such as those problems created by disaster tows of low OY species), successful prosecution of the fishery may require some collective effort on the part of fishery participants. A fishery comprised of prosocial individuals are likely to form voluntary arrangements to solve those problems in an IFQ fishery relatively easily, while a fishery comprised of proself individuals may face difficulties in developing a voluntary collective management program. Such characteristics speak to the appropriateness of establishing mandatory co-ops, or of establishing a program where cooperative institutions may form voluntarily. For sectors where it appears that collective problems may be present and there is a relatively high likelihood of voluntary cooperative arrangements forming to deal with such problems, establishing a system of IFQs, or limited entry, may be sufficient for those sectors to develop voluntary cooperative agreements. Alternatively, in sectors where collective problems may be present and participants tend to be either prosocial or proself individuals depending on the circumstance, there may be cases where mandatory cooperatives are appropriate. In cases where participants are extremely proself individuals, a cooperative arrangement (either voluntary or mandatory) may not be successful because those participants may face extreme difficulties in working collaboratively. In such cases administering IFQs may be the best decision, however multiple other considerations play into the appropriateness of co-ops or IFQs.

Another variable influencing social motives is "culture." Individuals from a prosocial culture will tend to behave cooperatively with members in their own group while competing with members from another group. Individuals from a proself culture will tend to focus on their individual objectives and consider the impact on others very little.

The payoff structure can be described as rewards or penalties of acting cooperatively, or of not acting cooperatively, in a commons problem. Payoffs can be financial and social. A social payoff structure is one where an individual receives approval from their counterparts for various activities. Psychological research suggests that individuals that have an opportunity to meet their counterparts ahead of time, and remain in contact with their counterparts during activity, were more likely to engage in cooperative behavior than individuals that did not previously meet their counterparts, or who did not stay in contact. The potential social payoff structure is linked to the culture variable described above. When considering whether to implement IFQs or harvest co-ops in a fishery, it may be worthwhile to consider whether the fishery sector has a "culture" where participants know each other ahead of time and are likely to continue to stay in contact while engaged in harvesting.

Power and status imbalances within groups make it difficult for individuals to reach cooperative agreements. Individuals in a group with power and status imbalances tend to focus more on their own well being. Research has shown that collective groups with power imbalances tend to make less efficient use of available resources, were more likely to begin the exercise distributing resources to a subset of the group, include fewer people in resource utilization across multiple rounds, and took more effort to reach agreements on resource distributions {National Research Council, 2002}. In the context of west coast groundfish trawl rationalization, power and stature is closely related to the initial allocation of quota shares and catch history. In groups where there are wide differences between catch history and status, the likelihood of cooperation is less than in groups where catch history and stature are more similar. Mannix's finding that power imbalances in a group make it more difficult to reach agreements on resource distributions can be solved by making resource distribution decisions for them. In a fishery, this can be done by assigning an initial allocation of quota shares—or catch history—to individuals instead of relying on the organization to arrive at a resource distribution decision. When considering the implementation of IFQs or harvest co-ops, the difference in power and status among participants in the fishery may be a useful consideration, because those sectors with power and status imbalances may face challenges when trying to form cooperative arrangements.

Group size theoretically influences the likelihood of successful collaboration in groups. Theory has suggested that the smaller the number of individuals in a group, the more likely it is that group will form cooperative relationships. This logic is consistent with the theories posited by Nash {Nash, 1950}. One hypothesis is that individuals in smaller groups believe that their contributions are more effective, and therefore they feel rewarded because of self efficacy. Empirical studies have both challenged and supported this hypothesis. One study found that larger groups achieve outcomes more optimally than smaller groups, while another study found that a reduction in the number of common resource consumers actually increased the consumption of that common resource {Isaac et al., 1994, National Research Council, 2002}. However, Rose (2002) finds that factors such as group size influence the ability of group members to monitor one another {National Research Council, 2002}. Specifically, smaller group size enhances the ability for individuals to monitor one another, and at relatively low costs. Given the envisioned structure of harvest co-ops under the existing alternatives, this point is particularly relevant because it is envisioned that agencies will monitor overall harvest levels (either at the fishery, sector, or co-op level), but in addition, participants in harvest co-ops would self-monitor the catch of each harvester to assure catch sharing agreements are adhered to. This information is applicable to rationalization of the fishery because the number of individuals in a group may affect the outcome and success of an IFQ or co-op system, and the number of vessels that will continue to operate because of accumulation limits will impact group size.

Among the most consistent findings in the experimental social dilemma, literature is that a period of discussion among participants yields positive cooperative effects {National Research Council, 2002}. Social research suggests that one reason discussion yields these positive effects is because discussion leads to commitments, and these commitments are largely held by individuals. Another study found that discussion can lead to consensus (collective commitments), and this creates cooperative behavior. One additional reason discussion may yield these positive effects is because discussion leads to a positive sense of group identification, though this effect is arguably not sufficient for cooperation. Associated with this concept is the question of whether information flow will help foster cooperation. Bohnet and Frey (1999) addressed this question and found that two-way communication had positive effects on behavior. This may suggest that fostering communication between harvesters of a common resource may improve the likelihood of cooperation. These findings have implications for rationalization of the west coast trawl fishery because they suggest that communication must occur between participants if they are to operate in a harvest cooperative, and information sharing (sharing of catch data for example) should occur between participants to foster cooperative behavior.

This information still begs the question as to which system is the most appropriate for the west coast groundfish trawl fishery. We address issues which may help decision-makers answer this question. To begin with, we identify some known characteristics of the limited entry trawl fishery and relate that information to the paragraphs above. We show that each sub-sector of the trawl fishery has different characteristics which may suggest the appropriateness of an IFQ or a harvest cooperative program for each of those sectors. Second, we review available literature in an attempt at outlining the various characteristics exhibited by collective environmental management systems and individual transferable quota-based environmental management systems. We find that there are some differences between the two institutions that have relevance to the west coast groundfish trawl fishery. In particular, two institutions display differences in the following issues: "large" versus "small" markets and environmental issues; the complexity of the resource and management system; the economic practices fostered by each institution; the social structure of each institution; and the adaptability of each institution to shifts in environmental or social conditions. There are other differences, such as the response to particular aspects of commerce, however, they do not appear relevant to the alternatives under consideration, or to the west coast groundfish fishery.

The sub-sectors of the trawl fishery differ in terms of their fleet size, the species targeted, historic participation in the fishery, and some information which hints at the willingness to collaborate over common problems.

- Fleet size is smallest in the catcher-processor sector, followed by the mothership sector, the shoreside whiting sector, and the shoreside non-whiting sector respectively. Since the literature suggests that group size influences the success of collaboration in groups, this information suggests that collaboration may be fairly pronounced across the entire catcher-processor sector. Collaboration may also occur across the other sectors, but it is more likely that there will be multiple collaborative groups within each of the other sectors.
- The species targeted in the three whiting sectors is largely the same across each participant in those sectors, but the species targeted in the non-whiting sector can differ substantially across vessels. For instance, some vessels may specialize in shelf flatfish opportunities while others may specialize in deepwater slope species. This suggests that the objectives of participants in the non-whiting sector may differ substantially, while the objectives in the whiting sectors may be more similar.
- Historic participation varies depending on the sector. In the catcher-processor sector, historic participation is quite similar and participants in this sector have stated that this is one of the reasons for the successful formation of the voluntary cooperative (because decisions over

resource sharing were relatively easy). In the mothership and shoreside whiting sector, historic participation is more diverse and likely provides some of the justification for the catch history assignments that exist in the mothership and shoreside whiting sector cooperative alternative. Finally, in the shoreside non-whiting sector, historic participation is substantially different across participants. This is because of the number of species targeted in the fishery and also because of the relative difference in the historic time-line of participation in the fishery by existing participants.

- The willingness of each sector to collaborate over common problems can be informed, to some degree, by past actions. In the catcher-processor sector, the voluntary cooperative has taken action voluntarily to avoid overfished stocks, and at times have elected to stop fishing to halt the catch of those stocks. The mothership and shorebased sectors of the whiting fishery have also taken some voluntary actions to avoid overfished stocks, but the actions appear to be less stable and may have lasted for a smaller duration of time. This could be because such actions are not part of a contract that would presumably exist in a voluntary cooperative. Limited information exists to suggest the level of willingness of non-whiting fishery participants to collaborate over common problems. Anecdotal information suggests that some participants in the non-whiting sector are avoiding areas of known overfished species abundance because catch of those stocks is a collective problem, but this information has not been verified.

In addition to the different characteristics of participants in each sector, the characteristics of each of the potential programs can differ quite substantially. The following table was partially adapted from Rose (2002) {National Research Council, 2002}, and summarizes the different characteristics of IFQ and cooperative programs that may be worthwhile when considering a system of IFQs or harvest cooperatives. These characteristics are explained in more detail in the paragraphs below.

	IFQ Characteristic and Compatibility	Co-op Characteristic and Compatibility
Scale of market and fishery management issue	Better in larger, thick markets and large environmental management issues	Better at dealing with thin market situations and smaller management issues
Resource and management complexity	Better in simple systems	More adept at dealing with – and evolving into – complex systems
Economic practices	Participants focus on profitability and innovation	Participants have more perspective on long-term stability and risk sharing
Social structure	Loose and stranger relations among participants	Close knit relations among participants
Ability to deal with new entrants	Better able to deal with new entrants	Not as adept at dealing with new entrants

Individual transferable quotas and collective management institutions are used to handle different sized scenarios. ITQ-based institutions are typically used to handle large-scale environmental management issues, while collective management institutions are used to handle smaller scale environmental management issues. These systems are also more or less adept at dealing with large and "thick" markets versus small and "thin" markets. Defining what is a "large" and "small" issue is of course somewhat subjective, however, the literature suggests that large-scale management issues (in this context) are those where the overall objective is determined by a government and standards are imposed on individuals so that the collective whole achieves the overall objective. A small issue is one where a group can determine an objective and can take actions within that group to achieve that objective. An example of a large-scale environmental management issue is air pollution. A community may decide to undertake actions to reduce air pollution, but that community cannot independently solve air pollution problems if others are contributing to the problem. Solving that problem is likely to require government intervention. ITQs and collective management institutions also deal with large and small markets differently. ITQ systems work effectively in markets that are "thick," or where there are a sufficient number of potential transactions available at any time so that individuals cannot hold out or engage in strategic bargaining. Collective management institutions do not necessarily rely on price signals and individual ownership, so they do not present the opportunities for holdouts and strategic bargaining scenarios. Therefore, collective institutions may be better suited for dealing with thin market conditions. This concept may be particularly relevant to issues facing the west coast groundfish trawl fishery where the trawl allocation of some species may potentially create "thin" markets in an ITQ system.

ITQs and collective management institutions also differ in the way they deal with resource and management complexity. Individual transferable privileges rely on price signals to influence outcomes. Price signals and efficient setting of prices is most effective in systems that are relatively simple and where expectations can be reasonably well established and met. Collective management institutions do not necessarily rely on price signals and may instead rely on a series of social and community-based rewards and standards. These collective institutions tend to develop into—and be more adept at dealing with—complex and interactive systems.

The types of economic practices that tend to be encouraged by both systems also differ. ITQ-based systems tend to promote profitability and innovation, while collective systems tend to promote long-term stability and risk-sharing. However, it is important to note that the literature contrasts ITQs and community-based management institutions on this topic. While harvest cooperatives can be loosely described as a type of community, the literature generally refers to community-based management systems as those tied to a geographic place, or town. Members of a harvest cooperative do not cooperate in marketing aspects, only in the harvesting. Therefore, it may be reasonable to state that harvest cooperatives also act in a way that promotes profitability, like ITQ systems, because of the competition that exists in the marketplace. This being said, it is almost certainly the case that harvest co-op systems foster risk sharing. Such risk sharing may have an influence on innovation.

The social structure of ITQ and collective systems is fairly different. Individual transferable quota systems tend to be made up of individuals with looser and less familiar relations than collective institutions. Collective institutions tend to be more close-knit. This concept is related to the degree of complexity in the system and the ease of entry and exit. Since collective institutions tend to develop into more complex arrangements, those institutions must be close knit in order to foster relationships, communication, and understanding. In addition, collective institutions rely on there being a slow turn-over of individuals, or barriers to entry and exit, as this enhances the connectivity of individuals in that collective organization. Because individuals in a collective system are typically "stuck with" one another, they have more opportunities to engage on multiple fronts and deal with complex issues. In order to develop and sustain the relationships necessary to deal with these complex issues, it may be necessary to ensure that individuals do not have opportunities for easy entry and exit. Based on this information, when considering whether cooperatives are appropriate for a fishery sector, it would be worthwhile to consider the culture of participants in the sector and whether that culture has relationships that appear necessary for collective management. In addition, since relationships appear necessary to sustain collective institutions, it may be necessary to impose rules that make entry and exit difficult. Such rules may include not making catch history divisible in a co-op program. This issue may also be relevant to the question of whether to establish linkages between harvesting and processing entities if the relationships between the two entity types are necessary for the success of the collaborative institution.

The literature also suggests that ITQs and co-ops differ in their adaptability to social and environmental conditions. ITQs tend to be more adept at dealing with social change (primarily demand conditions), whereas collective-based systems tend to be more adept at dealing with environmental change (shifts in resource abundance). These findings may not be entirely applicable to the alternatives being considered for rationalization (especially the response to environmental conditions) because such standards (allowable catch levels) are set by the government regardless of whether ITQs or harvest co-ops are put in place. However, one finding in the literature is that ITQ systems are better able to deal with social change that comes in the form of new entrants. This is because such a system can afford to deal with new entrants and does not rely on the same level and type of social relationship that is necessary for the successful operation of collective management institutions, like harvest co-ops. A collective institution may rely on stronger relationships and closer ties, which may be difficult to establish and maintain with new entrants.[12]

4.4.3.1 *Harvest Cooperatives and Individual Fishing Quota Systems in Weak Stock Management Conditions*

In this section, we consider the difference between the co-op and IFQ institutions under weak stock management conditions. In particular, we consider weak stock management issues that have been discussed in the Council arena, which some believe may generate Olympic-style competition amongst trawl harvesters. This belief is contrary to the traditionally expected outcome of no competition; nevertheless, conditions and scenarios may exist which may create Olympic fishery conditions. Some argue that an Olympic fishery could develop under IFQs or co-op management because of species with low OYs or low trawl allocations and the manner in which they would be managed under the two programs. In the case of harvest cooperatives, the existing alternatives call for setting bycatch limits that would close the fishery, the sector, or the co-op when a bycatch limit is met. One fear is that, since the non-co-op portion of the fishery is constructed to be a competitive fishery, participants in that fishery could fish irrationally. Because of this irrational behavior there is a risk of a disaster tow,[13] which could take a substantial portion of the sector or fishery allocation of a constraining bycatch limit species. In this event, the fear is that the entire fishery would turn into an Olympic fishery via a race for bycatch. To address the likelihood of this scenario we consider the likely response of the co-op fishery in the event of a non-co-op fishery disaster tow[14] and whether the most likely response from the co-ops is to continue fishing collaboratively, or whether the most likely response is to engage in an Olympic fishery.

Theoretically one could address this question in a manner that is similar to a prisoner’s dilemma where the potential reward that one individual faces depends on the actions of another. However, in order to construct that framework, the outcomes of making each decision must be known. In this case we don’t know the outcome associated with making the decision to engage in an Olympic fishery or to fish collaboratively, and therefore we cannot construct a model to show whether a race for fish would ensue or whether co-ops would work collaboratively in the event of a non-co-op fishery disaster tow. However, we do have some empirical information from the Pacific whiting fisheries which suggests a certain response to these conditions.

[12] While it may prove difficult for new owner-operators to enter the fishery in a harvest co-op system, new employees may join a company that comprises a portion of the cooperative organization and work their way up the ranks to a skipper and/or shareholder, thus becoming a “new entrant” into the fishery. However, it is still likely that an IFQ system is easier for new entrants.

[13] A disaster tow is generally described as an unexpected catch event of a large magnitude. This term is often used to describe cases where the catch event is so large that it may put at risk the fishing opportunities of an entire sector or fishery.

[14] Another issue that may generate Olympic fishery conditions is the level at which bycatch is managed in the whiting sectors—either at the fishery, sector, or co-op level. This issue is closely related to the size-of-group issue discussed in previous sections and whether collaboration can be successful if groups become too large. We address this issue in the analytical scenarios instead of addressing it here.

During the 2005 fishery there was a disaster tow of canary rockfish in the whiting fishery that put at risk Pacific whiting fishing opportunities for the remainder of the year. The response of the whiting fishery was to attempt fishing in a way that reduced bycatch so that the whiting OY could be attained. The catcher-processor cooperative was maintained and the whiting fishery continued throughout the year with the three sectors taking all, or the majority of, their whiting allocation. This suggests that collaborative behavior can occur within the whiting fishery under conditions similar to a potential disaster tow in a non-co-op fishery. Furthermore, since the mothership and shorebased sectors of the whiting fishery are competitive fisheries under status quo conditions (as would be the case in a non-co-op fishery), this suggests that participants in a non-co-op fishery may also work collaboratively to avoid bycatch even though they will be in competition among themselves for the whiting resource. On the other hand, experience in the 2007 fishery suggests that under conditions that are too constraining, fishers will begin fishing in an Olympic manner because of the race for bycatch. This empirical information suggests that the likelihood of an Olympic fishery occurring because of a disaster tow in the non-co-op fishery depends on the magnitude of the disaster tow relative to the bycatch cap. If the disaster tow is relatively large, fishers may not believe that collaborative behavior will be successful in avoiding those species and therefore engage in behavior that is similar to a race for fish. However, if the disaster tow is not large relative to the overall bycatch cap, then fishers may continue fishing collaboratively.

In an IFQ fishery some have hypothesized that a race for fish via a race for bycatch could ensue as well. The argument is that because of the low availability of quota for low OY species, fishers may not be able to find or afford to purchase quota pounds if they have a disaster tow that puts them into a deficit. If a fisher does not cover their deficit yet NMFS closes all or a portion of the fishery upon attainment of the allocation, then this would essentially “short change” or “preempt” someone. Under these conditions, the actions of one harvester can impact another harvester and this begins to break down one of the necessary conditions for harvesters to fish “rationally.” Under this condition, the response of harvesters could be to fish earlier in the year to minimize the risk of being preempted by such an event. Under the most extreme example this could turn into an Olympic fishery because of the fear of preemption over bycatch. Unfortunately, empirical information does not exist in the non-whiting fishery that would suggest one response over the other, however, in this example the response is likely to depend on the ability of harvesters to work collaboratively.

In summary, some empirical evidence suggests that harvesters in the whiting fishery will continue to work collaboratively among themselves (i.e., fish rationally) even if a disaster tow occurs in a fishery with a collective bycatch limit. Furthermore, experience in the fishery suggests that non-co-op fishers may collaborate with other harvesters in order to successfully avoid bycatch even though they are fishing competitively for whiting. At some level however, harvesters may not believe that such collaborative behavior will be successful in avoiding and managing bycatch, and under this scenario harvesters may begin to act competitively. Unfortunately information does not exist in the non-whiting fishery which would help inform the likely reaction that harvesters in this sector would have to disaster tow events. Furthermore, it is uncertain whether empirical evidence from the whiting fishery can be extended to the non-whiting fishery, because many have argued that substantial differences exist between the two fisheries, and therefore substantial differences likely exist between the culture of the two sectors and the relationships that harvesters in each sector have between themselves. Regardless, since a disaster tow in the non-whiting fishery will create a fishery-wide concern, the likely success of harvesters in the non-whiting fishery continuing to fish rationally in such an event is likely to require collaboration of some fashion.

4.5 Exvessel Price Negotiations in a Rationalized Trawl Fishery

Through the implementation of a system of harvest privileges, it is argued that profits will accrue, or be enhanced, to participants in a fishery. Several reasons for such profitability exist including consolidation of harvesting activity and improvements in the quality of harvested fish. Such changes reduce the cost of engaging in fishery activities and increase the value of harvested fish. Despite its advantages, a relatively small number of fisheries have implemented ITQs or similar rights-based management systems. Among the most important reasons are concerns over how profits in the fishery that accrue because of the implementation of ITQs are shared between participants in the fishery. One focus of such concerns deals with exvessel prices and the ability of harvesters or processors to set prices in their respective favor, thus acquiring much of the profit, or rent, that accrues as a result of implementation of a rationalization program. The possibility of significant changes in bargaining power between harvesters and processors over exvessel prices has been one focus of several recent studies including Matulich et al. (1996) and Matulich and Sever (1999), and Wilen (2007).

The effect of rationalization on exvessel price negotiations between harvesters and processors ultimately impacts the profitability of harvesting and processing operations. The degree of profitability associated with processing and harvesting operations will directly influence the value of capital assets associated with fishing and processing. In other words, the value of a capital asset is a function of the profit generated by that asset. Therefore, when considering the influence of rationalization on exvessel prices paid by processors and received by harvesters it is appropriate to consider the secondary effects those changes have on the value of fishing and processing assets.

Implied in this section is that either harvesters or processors hold the quota share necessary for prosecuting fishery activities and they are negotiating with one another over exvessel prices[15] as a means of securing revenue from the fishery. On one hand, processors view exvessel prices as a cost that, if lowered, could improve the revenue they generate from processing activity. On the other hand, harvesters see exvessel prices as a benefit that, if raised, could improve revenue generated from harvesting activity. If a third party held the quota share, both harvesters and processors may be negotiating with that third party and the outcome on profits to harvesters and processors may be vastly different from the outcome that is described in this section.

Economic thought would suggest that the holder of quota share should be able to realize all profits associated with harvesting and processing activity. For example, if harvesters were to hold all of the quota share, they would be able to bid up exvessel prices from processors until processors can no longer afford higher prices. The exvessel price in this case is the point where processors are covering their costs of operation (which include wages) but are not realizing any excess profit. Conceptually this scenario occurs because harvesters can essentially “hold out” and wait for processors to compete among one another for catch. The highest bidder theoretically receives all of the harvested volume as each harvester attempts to maximize their revenue by delivering to the highest bidder. By realizing that bidding higher exvessel prices than their competitors will mean that processors capture all deliveries, processors will continually bid up prices until they can no longer afford to. By allocating quota shares to processors, they are able to realize some of the profit associated with rationalizing the fishery. This can occur because they essentially pay themselves for the catch from quota they hold, but also because they gain bargaining power over exvessel prices because they can essentially “hold out” against harvesters while negotiating and in the meantime fish their own quota. It is unclear how much quota share would create balanced negotiation power between harvesters and processors. However, if a system of harvest cooperatives is established with harvester/processor linkages, the result can be different.

15 Exvessel prices are the prices paid at the dock by processors to harvesters for a pound of fish.

Harvest cooperatives with processor linkages have the effect of creating two powerful entities involved in negotiation. Literature has described this relationship as a "bilateral monopoly" as it relates to bargaining between the harvester and processor tied to one another through the linkage provision. Neither the harvester nor the processor can walk away from the negotiations and act independently in the short term. The harvester cannot prosecute fishing activities without a simultaneous action on the part of the processor. Inversely, the processor cannot engage in processing activities without a simultaneous action on the part of the harvester. In this case, both entities are in a strong position in the negotiation and profits become shared between both entities. It is not clear whether profits would be shared equally.

In order for harvesters to be able to acquire all profits from processors, harvesters must have a clear advantage in negotiations over processors after the fishery is rationalized. During public scoping and public testimony, several comments were made stating the belief that processors may retain negotiation power over exvessel prices even if harvesters receive all of the quota share. In order for harvesters to be able to leverage all profits from processors, several conditions would be necessary including the presence of a large number of buyers, and a cost of new entry into the processing sector that is minimal, or close to zero. Clearly many industries do not meet these conditions and information is available which indicates the processing sector on the west coast may be no exception. Several factors indicate this point including A) a limited number of buyers, B) large costs of entering into the processing aspect of the industry, and C) a relative concentration of production into a few number of processors. Based on this information, we assess the likelihood and degree of relative negotiation power between harvesters and processors in a rationalized fishery based on empirical evidence as it pertains to the harvesting and processing sectors on the west coast.

The information and analysis in this section is based upon an assessment of the structure of the existing harvesting and processing sector, empirical evidence of competition in the harvesting and processing sectors, and application of economic theory.

4.5.1 Pacific Whiting Trawl Industry

The Pacific whiting resource competes on a global whitefish market and in that market competes with other similar products such as Alaska pollock, and blue whiting among other things. In this market, whiting producers can be considered "price takers" or that they generally do not have influence over the price they receive for final products. Pacific whiting is often converted to surimi where it is used to form imitiation products such as imitation crab. Increasingly, however, Pacific whiting is sold in headed and gutted or fillet product forms to places like Eastern Europe and India. Many harvesters in the Pacific whiting fishery also participate in the Alaska pollock fishery. These vessels can be described as being relatively large trawl catcher vessels with an average capacity that exceeds the capacity of those vessels engaged in non-whiting activities. Several vessels in this fishery have reported hold capacities that range from 350,000 to 500,000 lbs. Harvesters in this sector use midwater trawl gear and harvest relatively large volumes of whiting in a trip. Such volume is necessary to justify harvest activity because whiting have a relatively low price per pound (less than $0.10 in recent years).

Participation in the harvesting portion of this fishery recently increased, leading to the Council's action to implement Amendment 15 to the groundfish FMP, which effectively established limited entry for the Pacific whiting fishery. The harvesting of Pacific whiting occurs in a fishery generally described as an Olympic fishery. Although capacity has been limited by the implementation of Amendment 15, harvesters in this sector still compete with one another for a common quota. While harvesters can legally coordinate their bargaining activities over exvessel prices through the Fishermen's Marketing Act, forming and maintaining such relationships is difficult in a competitive, Olympic-style fishery. In such a structure, one harvester can "cheat" and go fishing and when this occurs that harvester is having a direct effect on the harvest available to other vessels in that fishery. Such a possibility makes it very difficult to maintain relationships intended to negotiate with processors over exvessel prices. This inherently makes the harvesting portion of this fishery a highly competitive sector and such competition would tend to lead to lower exvessel prices for harvesters than would be the case if harvesters collectively negotiated higher prices. Anecdotal information suggests that exvessel price negotiations in the mothership portion of the whiting fishery are influenced by activities in the Bering Sea Pollock fishery. Those harvesters that participate in the mothership portion of the fishery often maintain relationships that exist in the Bering Sea Pollock fishery, and this often entails fishing for a mothership that the harvester has relations with through Pollock activities. Revenue generated through mothership fishing operations is often subject to profit sharing arrangements between the mothership and harvester entity, though at other times price contracts are specified prior to the start of the season (Paine, 2008. personal communication).

Shoreside processors of Pacific whiting utilize equipment that can be described as relatively specialized. The processing of Pacific whiting is highly mechanized in order to handle large volumes and such mechanization is possible because the whiting fishery targets a single species which is relatively uniform in size and shape compared to harvest in the non-whiting fishery. Pacific whiting processing can involve many steps which require several pieces of mechanized equipment: head and gut machines; fillet machines; de-boning machines, large tanks for "leaching"; and freezing equipment among others. From a Pacific coast perspective, the Pacific whiting fishery has grown in importance in recent years. The price per pound of whiting has improved and, as a result, an increasing interest has developed among harvesters and processors alike. In the processing sector, interest has grown as evidenced by continued development of Pacific whiting processing capacity in ports like Westport, Washington and Astoria, Oregon.

Several companies process shoreside whiting though five companies have handled the majority of the volume harvested between 2003 and 2007. Two companies (Ocean Gold and Pacific) identify themselves as "strategic partners"[16], though it is not immediately clear what this identified relationship entails. Three other companies (Trident, Jessie's of Ilwaco, and Ocean Beauty) round out the remaining of the top five companies by volume in recent years. Three of these companies (Ocean Beauty, Pacific Seafood, and Trident) also participate in North Pacific fisheries such as Alaska Pollock, Pacific halibut, and salmon. Entry by other companies has occurred in recent years, but that entry has been somewhat sporadic with companies like Da Yang, Del Mar, and Bornstein's handling whiting in a couple of the last several years, with much of that new interest beginning recently in 2006. This information suggests that entry into the Pacific whiting processing sector is possible and does indeed occur. The possibility of new entry would tend to make a sector competitive. In a competitive structure where processing companies compete with one another for harvest, the company bidding the highest exvessel price would theoretically receive all, or the majority, of the harvested resource. Empirically speaking, capacity will restrict the processing ability of a company, nevertheless the shoreside whiting processing industry can be considered competitive in the purchasing of fish from harvesters.

The following table is intended to be a representative set of information describing the companies that process shoreside whiting, the location of where those companies process shoreside whiting and the ports that whiting is purchased from.

[16] Ocean Gold's website lists Pacific Seafood as a strategic partner.

Processing Company	Processed City	Buyer City
Bornsteins	Astoria/Warrenton	Astoria
Da Yang	Astoria/Warrenton	Astoria
Del Mar/Olde Port	Astoria/Warrenton	Astoria
Jessies Of Ilwaco	Ilwaco	Ilwaco Westport Crescent City
Ocean Beauty	Newport	Newport
Ocean Gold	Westport	Westport
Oregon Brand	Charleston (Coos Bay)	Charleston (Coos Bay)
Pacific Seafood	Astoria/Warrenton Charleston (Coos Bay) Eureka Newport	Astoria Charleston (Coos Bay) Eureka Charleston (Coos Bay) Newport
Trident	Newport	Newport
W F Alber	San Francisco/Ilwaco	Crescent City

Vertical integration in the shoreside whiting fishery is somewhat less than in the mothership and non-whiting sectors. Three processing companies currently hold permits that participate in the whiting fishery, however rationalization may have the effect of lessening the degree of vertical integration in the shoreside whiting sector. Only one permit held by shoreside processing companies would stand to receive whiting quota that could be described as sufficient for engaging in directed whiting activity. Over time processing companies may acquire additional shoreside whiting quota depending on the accumulation limits. Vertical integration is important for determining the effect on price negotiation because it essentially acts as an allocation to processors, though it is specific to certain processors that have vertically integrated.

The mothership portion of the whiting fishery is characterized by a handful of firms that operate motherships. Three of the four largest firms have participated in mothership operations in every year since 1995. Other firms have participated sporadically during the 1995 – 2007 time period. The number of motherships in the sector has ranged from 8 to 4 depending on the year. Following the implementation of differential management between CPs and motherships in the at-sea fishery, the number of motherships has not exceeded 6. The lowest years of participation occurred during the 2002 – 2004 time period which was during the period of relatively low prices for whiting. The following table illustrates the mothership company and associated vessel operating during specific years.

		Year												
Company	Vessel Name	95	96	97	98	99	00	01	02	03	04	05	06	07
All Alaskan	Heather Sea	X												
	Saga Sea	X												
American Seafoods	American Dynasty		X											
	American Triumph		X											
	Ocean Rover	X	X	X	X	X	X	X	X	X	X	X	X	X
Arctic Storm	Arctic Fjord	X	X	X	X	X	X	X	X	X	X	X	X	X
	Arctic Storm	X	X	X	X	X	X	X	X	X	X	X	X	X
Peter Pan/ Nichiro	Golden Alaska	X	X	X	X	X	X							X
Premier Pacific	Ocean Phoenix	X	X	X	X	X	X	X				X	X	X
MV Savage Inc/ Cascade Fishing/ Suisan	Sea Fisher												X	
Supreme Alaska	Excllence	X	X	X	X	X	X	X	X	X	X	X	X	X

Vertical integration in the mothership sector is the largest relative to the other sectors. Based on available information, 10 limited entry permits that operate in the mothership sector are owned by 3 companies that operate motherships. This represents approximately 50 percent of the number of active mothership catcher vessels in any given year. This degree of vertical integration has important implications for negotiation between harvesters (those not vertically integrated) and motherships. Companies that own catcher vessels essentially pay themselves for catch from these vessels making variations in exvessel price irrelevant. Vertical integration under a rationalized fishery will operate as if processors receive an initial allocation of quota.

In addition to the above factors, the structure of the existing fishery is an important element in determining the outcome of rationalization. The Pacific whiting fishery is generally considered to be an Olympic fishery, with a large amount of volume occurring over the course of several weeks. Such conditions generally lead to more processing and harvesting capital being utilized in the fishery than would be necessary if the fishery was spread out over a longer time period. If the fishery were to occur over a longer time period, less capital would be necessary and this would tend to decrease the cost of engaging in Pacific whiting opportunities.

Olympic fishery conditions like that which exists in the whiting fishery, typically lead to high levels of competition among harvesters and processors alike. While harvesters can form bargaining arrangements through the Fishermen's Marketing Act which would allow them to hold out for favorable prices, the ability of these arrangements to be maintained over the long term is difficult because each harvester has a large incentive to cheat and go fishing. Under these conditions, it is likely that other harvesters will in turn go fishing, therefore reducing the ability of these harvesters to negotiate prices. Rationalization should make it easier for harvesters to form and maintain bargaining arrangements.

4.5.2 Non-Whiting Trawl Industry

The non-whiting portion of the fishery is a multi-species fishery with a focus on several types of soles, sablefish, and some rockfish. Other species were historically targeted in this fishery but regulations have limited access to these stocks because of their association with depleted species. Harvesters in this sector primarily use bottom trawl gear on the continental shelf and slope and tend to have a lower capacity than Pacific whiting vessels. Harvest in this fishery has declined over the last decade and inseason management of the fishery has become relatively unstable compared to previous decades. The reduction in harvest volume led to an erosion in the economic status of trawl harvesters and processors alike. This led to the implementation of a federal trawl vessel buyback intended to reduce harvest capacity in this fishery and improve the status of vessels remaining. There were a total of 163 non-buyback permits with some landings during the qualification period of 1994 to 2003, and 123 permits active in 2006 with approximately $25 million in exvessel revenue.

In the shoreside processing industry, several plants have closed down over the past decade leading to consolidation among shoreside processors and relatively fewer companies processing a greater percentage of the harvest. The harvest that occurs in this fishery is principally destined for fresh markets and therefore little of the harvest is frozen. Harvesters and processors alike may primarily focus on this fishery or engage in this fishery part time while focusing on other seasonal fisheries like Pacific whiting and Dungeness crab. Opportunities in this fishery are intended to accommodate year-round harvesting and processing activity, which fills voids that exist between harvest opportunities in other seasonal fisheries, or otherwise offers a year-round source of employment (for those that specialize in the non-whiting fishery). Harvesters and processors alike repeatedly indicate the importance of this year round fishery for maintaining crew and processing labor.

Since harvest in this fishery is comprised of several different species which are primarily sold into a fresh market, processing activity in this fishery is relatively labor intensive. Processing relies on relatively skilled personnel that manually head and gut and fillet species that are harvested by trawlers in this sector.

In order to foster the year-round goal of this fishery, regulations are created with the intention of spreading the harvest out throughout the year. These management tools evolved into two-month catch limits which effectively act as a two-month non-transferable quota for vessels in the fishery. Because of this two-month quota system, Olympic conditions do not exist in this fishery and large pulses of harvest over a short period of time generally do not occur, except in cases where prolonged episodes of poor weather have restricted harvest opportunities. The two-month limit structure and elimination of Olympic fishery conditions makes it more possible for harvesters in this sector to collectively negotiate over exvessel prices with processors compared to harvesters in the whiting fishery. However, the ability for these negotiations to occur appears to be somewhat limited by the length of the two-month period. If harvesters “strike” for longer than 60 days, they risk foregoing the harvest available to them during that two-month period. While managers may increase opportunities later in the year to make up for lost harvest, history has shown that often this is not possible because of time-sensitive interactions with rebuilding stocks and the fact that protecting rebuilding stocks often leads to a reduction in harvest opportunity for healthy stocks. This means that, while harvesters have a greater likelihood of collectively negotiating higher prices in the non-whiting fishery, the ability to do so may break down quickly as the end of a two-month limit approaches.

In general, since Olympic conditions do not exist, capital in this fishery should be expected to be more in line with available harvest (compared to the whiting sector, which may have more capital than necessary), however because of regulations and due to the reduction in harvest volumes over the past decade it is generally accepted that the harvesting sector remains over capitalized. Indeed, research by Lian, Singh, and Weninger (2008) indicate the non-whiting trawl fleet may be overcapitalized by more than 50 percent.

It is unclear whether and to what degree the shoreside non-whiting processing sector is overcapitalized, however information from the 2001 Groundfish Harvest Specifications EA indicated the number of fillet stations available at shoreside processors and the number of those fillet stations that were actively used. In 1997, approximately 83 percent of the available fillet stations were utilized, while in 2000, 51 percent were utilized. This information suggests that in 2000, the shoreside processing industry was overcapitalized by as much as 49 percent. However, because of recent consolidation in the processing industry it may be reasonable to expect that this same degree of over-capitalization no longer exists (meaning the processing sector may be less over-capitalized than the harvesting sector). However, it is generally accepted that excess capacity remains in the shoreside processing industry

Based on available information, the processing sector for non-whiting trawl groundfish is characterized by a relatively small number of processing companies processing the majority of the harvest. The three largest companies handle approximately 80 percent of the non-whiting trawl landings, while the fourth through sixth largest companies handle just over 10 percent of the landings.

As indicated previously, a relatively small number of companies handle the majority of non-whiting trawl volume. The plants operated by these companies acquire volume through satellite buying stations as well as acquiring deliveries at their main processing center. This means that those companies handling the majority of the volume also cover a wide geographic area. This pattern may very well exist because of the need to acquire sufficient volume to justify plant operation, but also to hedge against fluctuations in landings at individual ports. Radtke and Davis provide additional insights into the structure of the shoreside processing industry and reasons for consolidation:

> *Processing is being centralized to occur at plants in only a few regional commercial fisheries centers. The expense for equipment and refrigeration to meet new quality standards balanced against business risk makes it unlikely this trend will change.*

The following table illustrates this information by showing the company engaged in processing of non-whiting trawl groundfish, the city in which those fish are processed, and the port where those fish are purchased.

Processing Company	Processed City	Buyer City
Arrowac	Bellingham	Bellingham Bay
Bornstein	Astoria/Warrenton	Astoria
	Bellingham	Bellingham Bay Neah Bay
C - K FISH (Out Of Business)	Blaine	Blaine
Caito	Fort Bragg	Fort Bragg San Francisco
	San Francisco	Bodega Bay San Francisco
Cal Shell	San Francisco	Bodega Bay
Central Coast	Atascadero	Morro Bay
Del Mar/Olde Port	Astoria/Warrenton	Astoria
	Avila	Avila Morro Bay
	Watsonville	Avila Eureka Morro Bay Moss Landing San Francisco
Fitz	Half Moon Bay	Princeton / Half Moon Bay
Hallmark	Charleston (Coos Bay)	Brookings Charleston (Coos Bay) Newport
K Lyn	Charleston (Coos Bay)	Charleston (Coos Bay)
Morning Star	Half Moon Bay	Princeton / Half Moon Bay
Next Seafood	San Francisco	Moss Landing San Francisco
North Coast Fisheries	Santa Rosa	Bodega Bay Brookings Charleston (Coos Bay) Fort Bragg Moss Landing Oakland Princeton / Half Moon Bay
Oregon Brand	Charleston (Coos Bay)	Charleston (Coos Bay)
P & T Flannery	San Francisco	San Francisco
Pacific	Astoria/Warrenton	Aberdeen Astoria Garibaldi (Tillamook) Neah Bay Port Angeles Westport
	Charleston (Coos Bay)	Charleston (Coos Bay) Brookings
	Eureka	Bodega Bay Brookings Crescent City Eureka Fort Bragg San Francisco
	Newport	Charleston (Coos Bay) Garibaldi (Tillamook) Newport
	San Francisco	San Francisco
Pemberton Fish	El Granada	China Camp Princeton / Half Moon Bay
Royal Seafoods	Monterey	Monterey
Starvin Marvins	Charleston (Coos Bay)	Charleston (Coos Bay)
Three Captains	Half Moon Bay	Princeton / Half Moon Bay

Processing Company	Processed City	Buyer City
		Santa Cruz Vallejo
W F Alber	San Francisco	Crescent City Dillon Beach Morro Bay San Francisco

Vertical integration in the non-whiting industry exists, though not to the same degree as in the mothership sector. Available data at the time of this analysis indicates that 17 permits were held by 8 shoreside processors, but one of them may be appropriately classified as a whiting permit because of the type of quota share that would be allocated to it. These 17 permits represent 14 to 17 percent of the number of active permits in the fishery in recent years. This means that the non-whiting sector has a moderate degree of vertical integration if compared to shoreside whiting (less than non-whiting) and the mothership sector (more than non-whiting).

4.5.3 Existing Factors Influencing Negotiations in the Harvesting and Processing Sectors

The amount of competition that exists between processors in a sector and between harvesters in a sector is an important element in determining the effect rationalization may have on exvessel prices. A high degree of competition across a large number of processors would tend to play into the favor of harvesters if harvesters own quota share. This would occur because of bidding that processors would do among themselves for the catch that may come from harvesters. The more processors, the more bidding is likely to result in higher exvessel prices. Alternatively, fewer processors are likely to result in less bidding and therefore play less into the hands of harvesters.

The degree of competition that exists among harvesters under status quo will have implications for what would be expected to occur after rationalization. Harvesters that are able to form bargaining groups with relative ease under status quo may not have that ability enhanced to much of a degree under rationalized fishery conditions. Alternatively, harvesters that currently are unable to find much success in forming bargaining groups under status quo are likely to have the ability to do so enhanced to a relatively large degree under rationalized conditions. This is because in a rationalized fishery, the actions of one harvester do not affect the catch available to another and, therefore, the impact of one harvester in a bargaining group "cheating" does not have the same effect as would be the case in a derby fishery.

Existing negotiation factors in the non-whiting trawl harvesting and processing sectors

- Consolidation in the non-whiting processing sector appears to have been the consistent pattern over the past several years. This pattern appears to indicate consolidation into fewer geographic locations as well as consolidation at an overall scale. Astoria has become increasingly more important as a regional center of processing and harvesting activity in the Northwest. Consolidation into fewer regional centers may indicate less competition among companies at a regional level.

- While much consolidation has occurred in other areas, some new investment has been made in the processing industry near Astoria. One company recently made investments into a new facility in Astoria designed to handle groundfish, salmon, sardines, Albacore tuna, Dungeness crab and shrimp. Though this appears to be more of an exception to overall patterns, the reinvestment into shoreside processing capital is indication of some competition in shoreside non-whiting processing.

- Based on results from Lian, Singh, and Weninger (2008), harvesters in the non-whiting sector generate no economic profit from harvest activity. While it is unclear whether processors generate any economic profit from processing of non-whiting groundfish, it is clear that if profits exist in the industry, harvesters are not realizing those profits. This suggests that, if profits exist in the harvesting and processing of non-whiting groundfish, harvesters lack much bargaining power in negotiations over exvessel prices with processors.

- Harvesters in the non-whiting trawl sector do not operate in Olympic conditions and instead operate under a system of two-month quotas. Such conditions make it easier and more likely for harvesters to form negotiation agreements to bargain with processors over exvessel prices. This is because if one harvester in a negotiation arrangement "cheats" it does not influence the harvest available to others. The catch available to each harvester is available to each harvester during a two month period. In spite of this structure, harvesters apparently make no economic profit, meaning that they have apparently not leveraged any profits from processors (assuming profits are being generated by processors).

Existing Negotiation Factors in the Shoreside Whiting Trawl Harvesting and Processing Sectors

- As indicated above, new processing firms have entered into the shoreside whiting industry in recent years. Much of this recent interest has been focused around the Astoria area, though several processors in California have recently made attempts at entering into the processing of shoreside whiting. Such new interest and entrance into the shoreside whiting industry is an indicator of competition.

- Participation in the shoreside whiting fishery has increased in recent years, leading to the passage of the Groundfish FMP Amendment 15 to limit access to the fishery. Such increase in the number of participants suggests profits are available to harvesters in the shoreside whiting fishery and is evidence of competition among harvesters for the available resource.

- The shoreside whiting fishery is generally considered to be an Olympic fishery where harvesters compete among one another for the available harvest. Such conditions make it more difficult for harvesters to form and maintain negotiation relationships designed to leverage higher exvessel prices from processors. This type of structure generally leads to high degrees of competition among individual harvesters.

Existing negotiation factors in the mothership whiting trawl harvesting and processing sectors

- Information indicates one new mothership entered the fishery in recent years, but did not participate again in 2007. Three catcher vessels recorded deliveries during the 2005-2007 period that had not recorded deliveries during a previous time period. This new entry suggests that profits are generated in mothership sector activity and that competition exists among current participants.

- The degree of vertical integration in the mothership sector appears to be relatively large compared to other sectors. Vertical integration reduces the need for motherships to bid up exvessel prices in order to receive catch from independent harvesters because they can receive volume from their company-owned catcher vessels and "hold out" against independent harvesters.

- Anecdotal information suggests that many relationships that exist in the mothership sector are extensions of relationships that exist between entities in the Bering Sea Pollock fishery. Industry representatives have indicated that profit sharing arrangements exist between motherships and catcher vessels. It is difficult to determine the effect these relationship extensions have, however it may be reasonable to expect that the effect rationalization has on relationships in the mothership sector may be minimized to some degree by the effect Bering Sea Pollock has on the sector.

4.5.4 Implications of Existing Negotiation Factors on Exvessel Prices in a Rationalized Fishery

The information described above suggests that rationalization may have a larger effect on exvessel price relationships in the shoreside whiting sector than in the non-whiting sector. This is because rationalization will make it easier for harvesters in the whiting fishery to form bargaining groups useful for negotiating with processors over exvessel prices. In addition, rationalization may have the effect of lessening the degree of vertical integration in shoreside whiting sector because of the allocation formula, effectively reducing the harvest controlled by processing industries. Furthermore, the fact that new entry has occurred in the shoreside whiting processing industry suggests that processors in this sector are relatively competitive and therefore are more liable to compete with one another over deliveries from harvesters. This competition would be expected to play to the harvesters favor over exvessel price negotiations as those processors bidding higher prices would be expected to receive a disproportionate share of deliveries.

The reason exvessel prices in the non-whiting sector may not be impacted to the same degree is due to the fact that the existing structure of the fishery with two-month cumulative limits makes it relatively easy for negotiating groups to form among harvesters in this sector. Under rationalized fishery conditions, the ability for these harvesters to form negotiation groups may not be enhanced to the same degree as harvesters in the whiting sector. Furthermore, the relative lack of new entry by processors under the status quo regime suggests relatively lower competition among shoreside processors in the non-whiting sector and this may decrease the amount of bidding among processors for deliveries from harvesters. Nevertheless, if harvesters receive all of the initial allocation of quota share, there is reason to expect their negotiation power to increase. The fact that the two-month limit structure is replaced with quota that is available for a year extends the time horizon harvesters have to negotiate over prices without losing available fishing opportunity. However, new entry by non-whiting processors may occur if harvest volumes or the type of species delivered changes in the non-whiting sector, and this may increase the degree of competition among processors of non-whiting trawl groundfish, increasing the negotiation power of harvesters.

These implications have further implications for the allocation of quota made among harvesters and processors in the shoreside whiting and non-whiting trawl fisheries. The fact that it appears rationalization may influence exvessel prices in the shoreside whiting fishery more than in the non-whiting fishery means that allocating 100 percent of the quota share to harvesters in the whiting sector may increase exvessel prices relatively more in that sector than if 100 percent of the quota share is allocated to harvesters in the non-whiting sector. However, these implications depend on there being profits in the fishery to negotiate over in the first place – in particular that there are profits in the processing sector. If economic profits are not being realized, then there is no room for exvessel price negotiation, and therefore no reason to expect an increase in exvessel prices.

The mothership sector is vertically integrated relatively more than the shoreside whiting and non-whiting sectors effectively meaning that mothership companies stand to receive quota share regardless of whether an explicit allocation is made to processors. Furthermore, information suggests that exvessel price relations between motherships and catcher vessels are influenced to a large degree by activities in the Bering Sea Pollock fishery. This is evidenced by the profit sharing arrangements that apparently exist between harvesters and motherships (which is an outcome possible under rationalization). However, anecdotal information indicates that negotiations do occur in some instances between harvesters and motherships that involve negotiating price contracts. In these instances, rationalization may influence these negotiations by perhaps folding them into a system of profit sharing arrangements, or by influencing the negotiation power between harvesters and motherships. It is not immediately clear how much these negotiations may be influenced by rationalization, but a system of cooperatives will likely lead to a different outcome than a system of IFQs.

For those harvesters and motherships that currently negotiate prices in the mothership fishery, rationalization may lead to changes in the way profits and prices are negotiated. A system of IFQs imposed on the mothership sector will likely lead to a similar outcome as in the shoreside whiting fishery where an allocation to permits will tend to favor the negotiation stance of harvesters while negotiating over exvessel prices. If IFQ is allocated to motherships it will tend to increase the negotiating stance of those motherships. A system of harvest cooperatives may lead to a different outcome assuming cooperatives are established with mothership linkages. Under a cooperative system with mothership linkages, the operation of the harvester and mothership should begin to take on the operational characteristics of a vertically integrated firm where the goals of both the harvester and mothership become more aligned, largely out of necessity. The activities of the harvester will need to take into account the needs of the mothership and vice versa. Under this type of a structure it is more likely that a profit-sharing arrangement will develop between harvesters and processors. It is not clear how the exvessel price and profit sharing outcomes in the mothership sector compare to the outcomes in the shoreside whiting and non-whiting sectors.

Sector	Effect of Rationalization on Exvessel Prices if Allocation Made to Permits
Shoreside whiting	Relatively large: Shifting from an Olympic fishery to a rationalized fishery should allow harvesters to more easily form and sustain groups for negotiating exvessel prices. In addition, rationalization will have the effect of reducing vertical integration that currently exists because of the allocation formula.
Non-whiting	Relatively small: Bargaining power of harvesters could change, but not as substantially as in SS whiting because they currently have two-month quotas that make it relatively easy for bargaining groups to form.
Mothership whiting	Relatively small and/or case dependent: May have no effect in cases where relationships between harvesters and motherships are extensions of the BSAI Pollock fishery. May have an effect in cases where harvesters and motherships do not have relationships from BSAI Pollock activity. In these cases, the effect may be similar to that in shoreside whiting because of the elimination of derby fishery and formation of bargaining groups among harvesters.

4.6 General Effects on Environmental Components Where No Significant Impacts are Anticipated

During scoping a wide range of groups and resources were identified that could potentially be affected by trawl rationalization. These were incorporated into the Stage 1 Document, which was a proposed analytical framework and EIS outline released in September 2006 {NEI, 2006 1446 /id}, as separate sections of Chapter 4 that would be evaluated in detail. Subsequently, the analytical team reviewed the analytical framework and outline and made a variety of revisions. Through this process it became apparent that it is very unlikely that these groups or resources would be significantly affected by the proposed action. Furthermore, as with some of the environmental components that are evaluated in more detail (input suppliers, labor) because adverse effects are more likely, only broad effects can be identified. In those cases only status quo and the overall implementation of a trawl rationalization program can be compared; the analytical scenarios don't reveal noticeable differences in terms of anticipated impacts. This is also the case with the resource components discussed in this section.

The following sections qualitatively describe potential effects to each component. Only broad-level effects can be discerned, so any comparisons are between status quo and the implementation of a trawl rationalization program incorporating any combination of the features described in Chapter 2 under the alternatives. Some attention is also given to the reasons to expect that the impacts will be modest and therefore unlikely to be found significant.

4.6.1.1 *Buyers and Processors That Do Not Purchase Trawl-caught Groundfish*

Because they do not purchase trawl-caught groundfish, these buyers and processors will not be directly affected by the proposed action. Three types of indirect effect are described below.

First, the distribution of IFQ to processors could increase barriers to entry to the trawl groundfish processing sector for those processors that want to diversify (or switch) into that sector. They would not benefit from the windfall of initial allocation and would have to pay for all of the IFQ they may wish to acquire. It would be difficult to enter the sector without purchasing IFQ because they would likely have to pay higher exvessel prices than those that could use IFQ as leverage in price negotiations.

Second, if trawl-caught groundfish buyers and processors increase their market power and consolidate they may subsequently expand the scope of operations (by horizontally integrating) and enter markets for non-trawl-caught fish. If they have more access to capital and operate more efficiently they would be able to out-compete existing operators, either forcing them out of business or purchasing their operations. (More likely, it would be a combination of these two strategies where they enter the market, and by out-competing, make existing operators sell out for a price below their opportunity cost.)

Third, the overall viability of some west coast ports for fishing-related activities could be compromised by consolidation. Groundfish trawl vessels could relocate operations to a fewer number of ports that offer advantages in terms of distance from favored fishing grounds and infrastructure. This could have a ripple effect whereby processors and input suppliers relocate or go out of business. If this in turn makes it difficult for other fishing vessels to use the port, even those processors that do not buy from the groundfish trawl fleet could be affected. This can be related to the concept of economies of agglomeration whereby related businesses cluster in a geographic area because of the positive externalities of having input suppliers, skilled labor, and other factors of production co-located. Such effects may be modest, however, because most west coast ports are small so the attendant scale of agglomeration is limited.

4.6.1.2 *Recreational Harvesters*

Recreational harvesters are unlikely to experience discernable effects from trawl rationalization. Trawl rationalization by itself will not affect fishing opportunity because the allocation of harvest opportunity to the trawl sector (and potentially between the non-trawl sectors) is addressed through separate actions. One action establishes fixed allocations between trawl and non-trawl sectors. An [EA] has been prepared evaluating the impacts of these inter-sector allocations. A second, ongoing process, biennial harvest specifications, will continue to be used to establish short-term allocations for severely constraining overfished species, minor shelf rockfish, and the Other Fish complex. The effects of biennial harvest specifications have been evaluated in either an EA or EIS (since 2003 EISs have been prepared); future harvest specifications will be similarly evaluated. Both allocation processes seek to maintain recreational fishing opportunity, taking into account constraints imposed by stock abundance.

Recreational fisheries could be affected by consolidation-related impacts to fishing communities discussed elsewhere in this document, such as the loss of input suppliers that depend on groundfish trawl vessels for a substantial proportion of their business. It is unlikely, however, that this would have a substantial impact on recreational harvesters. First, the types of services and amenities that recreational harvesters depend on (e.g., charter operations, boat ramps, bait suppliers, tackle shops) are unlikely to be so substantially affected by the loss of trawl vessels in a port community that they would cease to function. Second, most recreational harvesters do not live in coastal communities. They therefore have some flexibility in terms of where they make purchases and where they may go to fish.

4.6.1.3 *Consumers of Groundfish Products*

Consumers of groundfish products could benefit from greater availability of target species, greater availability of product throughout the year, and new product forms. New markets that may develop as a result of trawl rationalization would benefit those who previously were unable to consume groundfish. Although the allocation of IFQ between harvesters and processors is likely to affect exvessel prices, any increase in those prices is unlikely to be passed on to the consumer because groundfish products face price competition from a wide variety of fish products. Prices could decrease if the supply of target species increases due to the development of successful bycatch avoidance strategies. Related to this, there is probably no one who consumes groundfish exclusively; consumers readily switch between fish products based on price and availability. Overall, then, trawl rationalization is expected to have modest beneficial impact for consumers.

4.6.1.4 *General Public*

The general public refers to non-consumptive resource 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). Effects to consumptive users (commercial and recreational fishers, processors, consumers of groundfish) are addressed in other sections. Of course, consumptive users may also derive value from non-consumptive and nonuse resource attributes. Therefore, it’s more appropriate to consider the general public in terms of how directly engaged individuals are with the resource. Consumptive users are directly dependent on the groundfish resource for their livelihood (commercial fishers) or satisfaction (recreational fishers). Non-consumptive users may gain a livelihood from environmental amenities (e.g., whale watching charter operations) or enjoyment of the natural marine environment of which groundfish are but one part. Nonusers have an abstract relation to the resource that is expressed through broad social or public policy preferences, such as a desire for more rigorous regulation of consumptive activities to preserve existence, option, or bequeathal values. An individual will exhibit variation across these attributes expressed in terms of their prioritization and commitment to different uses and values. For example, a commercial fisher is likely to prioritize consumptive use but may also have nonuse values, albeit at a lower priority and level of commitment (i.e., be more willing to trade-off long-term existence value for short-term consumption value). On the other hand, a nonuser who does not interact with groundfish directly (through consumptive or non-consumptive use) may prioritize environmental preservation but have a low level of commitment to advocating for specific social preferences or public policies to manage groundfish fisheries in a way that would produce a different suite of benefits (favoring nonuse of the resource over consumption).

Trawl rationalization could affect non-consumptive and nonuse values if it led to substantial declines in stock abundance and secondarily if these declines had a clearly discernable effect on ecosystem function. Effects to groundfish, other fish, protected species, and the marine ecosystem are described in other sections of this chapter. Substantial adverse effects to these environmental components are not expected. Considering that groundfish are just one of a suite of amenities that support non-consumptive use and nonuse, even the moderate changes in stock abundance (through greater access to target stocks) would have a minor to negligible effect on these values.

Coastal communities provide services to non-consumptive users (e.g., experiencing a working waterfront) and existence value for nonusers. As discussed in the section on communities, the character of some coastal communities could change as an indirect effect of fleet consolidation. However, any such changes, such as the disappearance of trawl vessels and related infrastructure, is unlikely to be discernable to most non-consumptive users and nonusers. For communities that have a diversified economy or substantial tourism some of these changes might even beneficial for non-consumptive users. For example, wharfs and waterfront facilities could be converted to uses more directly related to tourism. While this could further alter the fundamental character of the built environment, the effect on non-consumptive users is mixed since it represents a tradeoff between authenticity and amenities directly supporting non-consumptive use.

4.6.1.5 *Other Fish Resources*

A variety of non-groundfish species are caught incidentally by the groundfish limited entry trawl fleet. The 2008 Groundfish SAFE document {PFMC, 2008 1529 /id} describes the various non-groundfish species caught by trawl gear. Arguably, the most important incidentally caught species—because of the amount caught and its commercial importance—is Pacific halibut. The International Pacific Halibut Commission develops management measures for U.S. and Canadian fisheries catching Pacific halibut, which are implemented through domestic regulations in each country. As part of this process a TAC is set for the west coast EEZ. The Council allocates a portion of this TAC for bycatch in the groundfish limited entry trawl fishery; retention of this species is prohibited if caught with trawl gear. The alternatives described in Chapter 2 include an option for establishing an individual bycatch quota (IBQ) for Pacific halibut. This would convert the current allocation into a system of tradable quotas similar to that proposed for groundfish species. However, retention of halibut would continue to be prohibited to discourage targeting. Such a system would impose the same type of individual accountability described elsewhere in this chapter to Pacific halibut bycatch. This is likely to have a beneficial effect because bycatch would be more precisely managed and there would a greater incentive to reduce Pacific halibut bycatch.

Previous environmental impact evaluations of groundfish biennial harvest specifications {PFMC, 2006 1407 /id} have found that the groundfish limited entry trawl fishery has a negligible impact on non-groundfish species because catches are small and accounted for in the assessment of those stocks and the management of relevant non-groundfish target fisheries.

4.7 Impacts to Limited Entry Trawl Groundfish Harvesters

In this section we describe the impacts of rationalization on limited entry trawl groundfish harvesters. This group is composed of individuals owning or operating groundfish trawl catcher vessels, individuals holding or owning limited entry trawl permits, or some combination thereof. In several cases, entities holding limited entry trawl permits may be processors of limited entry trawl caught groundfish. Such entities are not examined in this section, but are examined under section 4.10, describing impacts to processors of trawl groundfish.

We begin the section by providing a description of methods used to assess effects on groundfish trawl harvesters and the metrics used to illustrate those effects. This initial section is intended to assist the reader by establishing expectations about what is measured and identified so that the reader can anticipate some of the variables that can be compared and contrasted between the analytical scenarios. Following the description of methodology we discuss broad-level effects of rationalization on groundfish trawl harvesters. This section serves as a description of the big-picture issues that are implied by the analytical scenarios, which the analysts believe may play a relatively important role when assessing the impacts of rationalizing the fishery. For some issues there is no contrast available between the analytical scenarios because the effect is limited to rationalizing the fishery or maintaining status quo. In other cases there are contrasts between the analytical scenarios and, if so, they are identified.

Following the description of broad-level effects, we assess the impacts of the analytical scenarios. This section begins by identifying the impacts that are expected to occur from each of the elements of the scenarios independently. This is done to provide the reader with background on the motivations that exist within the analytical scenarios and the fundamental reasons for why the scenarios are expected to have different impacts. Following the section which describes the impacts of the elements independently, we provide an assessment of each analytical scenario on groundfish trawl harvesters. This assessment is designed to be fairly programmatic in nature and examines the ways in which groundfish trawl harvesters are affected by the combined suite of options contained in each scenario. At the end of this section we provide a side-by-side summary comparison of the effects of each analytical scenario on groundfish trawl harvesters. Finally, we assess cumulative effects. This cumulative effects section briefly summarizes the past and present actions with ongoing effects on groundfish trawl harvesters, and the reasonably foreseeable future actions that are expected to have effects. The effect of these past, present, and reasonably foreseeable future actions are combined with the effect of the analytical scenarios to arrive at the cumulative effect.

4.7.1 Methods for Assessing Impacts

In this section we describe the methodology for assessing the impacts of rationalization on groundfish trawl harvesters. We briefly summarize the expected impacts of rationalization in order to put the methodology into a better context, but the reader is referred to the subsequent sections for a complete description of the expected effects and why those effects are expected to occur. In this section we describe the ways in which each of the expected impacts is measured and assessed. This section summarizes the potential impacts, the reasons why those impacts occur (the mechanisms), and the way in which the analysis and models measure those impacts (the metrics). Table 4-4 provides an overview of the approach used to estimate the impacts of the alternatives on trawl catcher vessels. The analytical approach includes 1) potential impacts, 2) mechanisms that relate the proposed action to the potential impact, 3) measurement criteria or indicators used in assessing each type of impact, and 4) models and data sets used in the analysis. This table shows that the expected impacts to trawl catcher-vessels are changes in vessel profits and fleet efficiency, individual and collective risk, and changes in vessel safety. The mechanisms that are driving changes in vessel profits include the distribution of harvest privileges, the pace of harvesting activity, changes in vessel catch, elimination of regulatory discard, exvessel price negotiation with processors, monitoring cost, harvesting cost, and fleet consolidation. Effects on individual and collective risks are driven by the probability of unexpected catch events, the presence of thin market conditions, and the cost of covering deficits. Changes in vessel safety are driven by fleet size, vessel operational flexibility, and the financial ability to invest in equipment and conduct vessel maintenance. Changes in the economic efficiency of the trawl catcher-vessel sector as a whole are primarily driven by. Each of these mechanisms that are drivers for the potential impacts are measured through listed criteria (third column), which are estimated through the methods described in final column. Many of these methods are described in detail in Appendix C.

Table 4-4. Overview of impacts, mechanisms, and metrics used to compare the effect of the no action alternative and the analytical scenarios on trawl catcher vessels.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods Used for Assessing Impacts
Changes in vessel profits and fleet efficiency	Fleet consolidation	Number of active vessels	Model of fleet consolidation
		Fleet-wide costs	
	Distribution of harvest privileges	Number of initial QS recipients	Model of the effects of initial allocation of IFQ
		Exvessel value of QPs allocated to participants	
	Pace and location of harvesting	Length of season	Capacity analysis and timing of resource accessibility
		Geographic distribution of fishing effort	Model of geographic shifts in fishery patterns
	Changes in vessel catch	Catch from increased access to target species via a reduction in bycatch of overfished species	Model of changes in bycatch rate, catch, and revenue
	Changes in the amount of regulatory discards	Increased retention of currently discarded species	EFP documentation of non-marketable discard
	Exvessel prices and negotiation with processors	Relative changes in exvessel prices	Utilization of microeconomic and game theoretical arguments
	Flexibility in harvest timing	Opportunities for modifying harvest timing	Qualitative assessment
	Monitoring costs	Cost borne by trawl catcher-vessels to meet monitoring requirements	NMFS research on tracking and monitoring programs
	Harvesting costs	Annual cost of harvesting activity	Model of fleet consolidation
	Ability to conduct business planning	Relative certainty over future fishing opportunities	Qualitative assessment
Individual and collective harvesting risk	Likelihood of catch events that are greater than quota pounds	Relative risk to harvesters of exceeding quota pounds	Qualitative assessment
	Cost of covering deficits	Availability of quota for covering deficits	Qualitative assessment
	Risk associated with the presence of thin market conditions	Risk posed by trading quota in volatile markets	Qualitative assessment
Changes in fishing vessel safety	Fleet size; vessel operational flexibility; and financial ability to invest in vessel maintenance and safety equipment	Occurrence of safety-related incidents	Qualitative assessment based on literature and expertise of analysts

4.7.2 Broad-Level Effects of Rationalization on Limited Entry Groundfish Trawl Harvesters

Limited entry trawl catcher-vessels and permit owners may be substantially affected by rationalization through a variety of mechanisms. These impacts are driven by the individual accountability for total catch (landings and discard) associated with rationalization, aspects of the existing alternatives that allow for consolidation, and the mechanisms that allow for harvest privilege transfers that are associated with the existing suite of alternatives.

In most instances, the limited entry trawl permit owner and catcher vessel owner is the same person; occasionally they are different people. Regardless, it is most straightforward to analyze the owners of catcher-vessels and permits in the same section because the impact on both parties is largely driven by the productivity of, and regulations applicable to, the vessel.

4.7.2.1 *Impacts to Groundfish Trawl Harvesters in the Non-Whiting Trawl Sector*

Trawl harvesters in the non-whiting sector may be substantially affected by the rationalization of the west coast trawl fishery. The individual accountability measures and harvesting privileges associated with the rationalization alternatives are likely to induce substantial changes to the manner in which vessels prosecute fishing activities. In the non-whiting trawl fishery, substantial impacts are likely to occur because of the constraining nature of overfished species and the perceived reward that is associated with avoiding those stocks that may come in the form of increased catch of target species, which are currently under-utilized because of weak stock management. The bycatch rate change model is used to show the amount of additional target species that can be leveraged as the non-whiting trawl fleet reduces encounters with overfished species. The output of this model indicates that the fleet may generate several million dollars in additional exvessel revenue under a rationalization program compared to status quo activity if exvessel prices remain constant.

Increased profits and fleet consolidation

Some of the expected increase in exvessel revenue is likely to occur almost immediately after the fishery is rationalized. However, the fleetwide estimates are best perceived as a longer term outcome of rationalization that will occur as the fleet modifies gears and fishing location, the flow of quota through the market occurs in a way so that it reaches the more successful vessels, and processing companies find buyers for the potential increase in product quantity. This is likely to be a gradual effect where exvessel revenue increases over time before reaching full potential. The length of time it takes for the increased harvest volume to be absorbed by the processing sector may also depend on the number of processing entities harvesters have the opportunity to sell their catch to. Relaxing the requirement that the entire catch be off-loaded at a single processor restricts–to some degree–the number of processing companies that harvesters deliver to. By relaxing this requirement, harvesters may be able to sell their catch to more than one buyer at a time, and if these buyers have relatively different access to markets, being able to sell catch to more than one buyer will make it more likely that an increase in catch can be absorbed by the market more quickly.

The following figure illustrates the potential range of exvessel revenues in the non-whiting trawl fishery generated under a rationalization program compared to status quo if exvessel prices remain unchanged. The range of values presented is meant to bracket the range of uncertainty within the model while still providing realistic estimates.

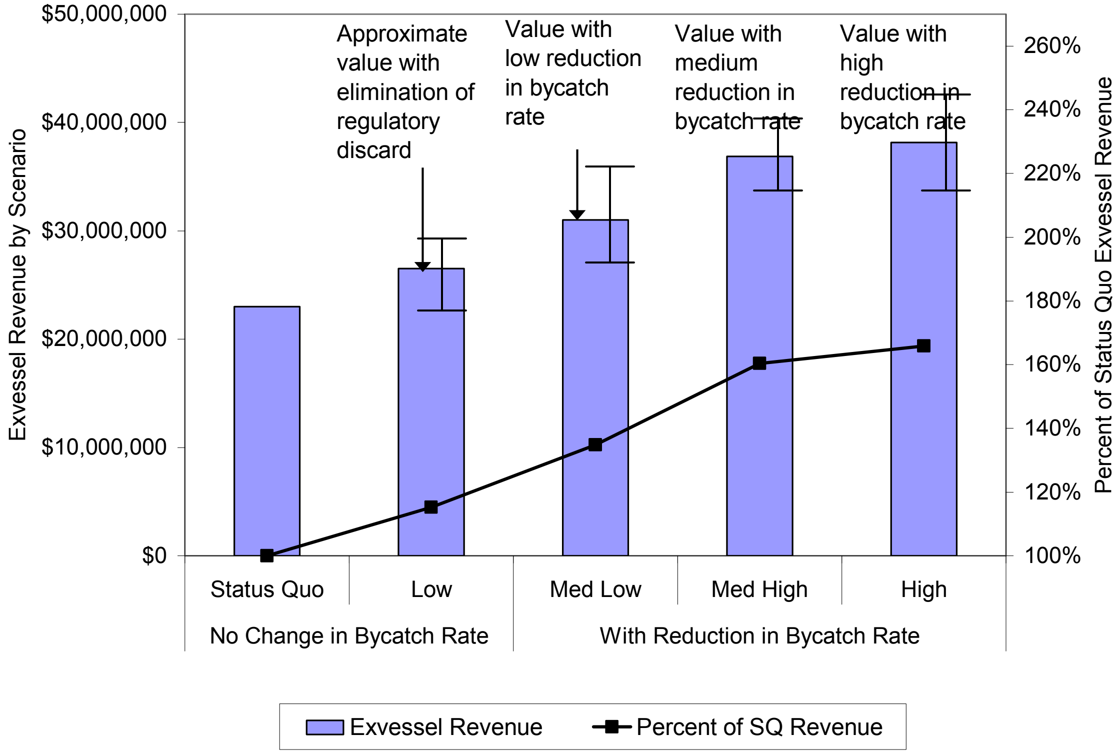


Figure 4–4. Potential exvessel revenue in the non-whiting trawl fishery under rationalization.

Note: Bars are intended to represent uncertainty that exists because of potential variations in ABCs and OYs. The uncertainty presented in this figure does not capture the risk posed by thin market conditions that may be present in an IFQ program because of species with low trawl allocations.

In addition to increased revenue being generated in the fishery, the consolidation likely to occur in the non-whiting sector is expected to lead to substantial cost savings. Cost savings occur because of less capital, but also because the fleet is expected to consolidate toward the most efficient vessels. The fleet reduction and cost efficiency model shows the consolidation that may occur could diminish the number of vessels by 50 to 66 percent, or to a non-whiting fleet size that is somewhere on the order of 40 to 60 vessels. This predicted cost savings is fairly sensitive to the design elements of the program and is also dependent on the quantity of species harvested. This consolidation is predicted to decrease costs of harvesting non-whiting groundfish by as much as 60 percent annually (before incorporating the cost of at-sea monitoring). Using information from recent years, this may mean a cost savings of approximately $13.8 million. Imposing accumulation limits or retaining the vessel length endorsement can restrict the amount of expected cost savings substantially. Retaining the vessel length endorsement may restrict cost savings by 10 percent, though this may be less since harvesters can bundle permits and change the length endorsement. If a one percent accumulation limit is placed on vessels, cost reductions may be restricted by approximately 20 percent.[17] At-sea monitoring costs add an additional cost burden to vessels that is not currently incurred. If at-sea monitors cost vessels $350 per day, this may tend to reduce the size of the fleet from the 40 to 60 vessels expected and increase the average size of vessels remaining. This is because additional costs of fishing will mean the optimal fleet size is smaller. The average size of vessels in the fleet is increased with a daily observer cost because such costs comprise a

[17] The lowest accumulation limit in the alternatives of three percent is not expected to impose cost inefficiencies on the non-whiting trawl sector so long as prices and available harvest volumes do not decrease.

larger portion of small vessels costs than that of larger vessels. At sea observers will also reduce fleet-wide revenues. The fleet reduction and cost efficiency model illustrates that at-sea observers may cost the non-whiting fleet $2.2 million if all vessels in the fishery operate near capacity. If some relatively marginal producers remain in the fishery, the cost will be higher. The following table illustrates the effect of various factors on profitability.

Effect of Consolidation	Improves harvesting cost efficiency. May allow the fleet to realize profits of ~$14 to $23 million compared to $0 or less under status quo.
Effect of Accumulation Limits	No effect unless vessel limit is smaller than ~2.5 percent. A one percent vessel limit restricts potential cost efficiency by ~20 percent
Effect of Permit Length Endorsement	Restricts cost efficiency by ~10 percent, or imposes costs of ~$1.5 to $3 million
Effect of At-Sea Observers	Increases average vessel size slightly. Decreases fleet size slightly. May reduce profits by ~$2.2 million depending on fee structure.

The following figure shows potential fleet-wide profit if all vessels are operating at their most cost effective point. The results in this figure use the fleet-wide revenue estimates shown above in conjunction with the cost savings and consolidation model. The results show profit under unconstrained cost conditions, profit with a vessel length restriction (i.e. retaining the permit length endorsement), and profit with a vessel length restriction and at-sea observers. Although not shown in the figure, for reference purposes status quo profits in the fleet are estimated to be between 0 and a loss of approximately $2 million annually.

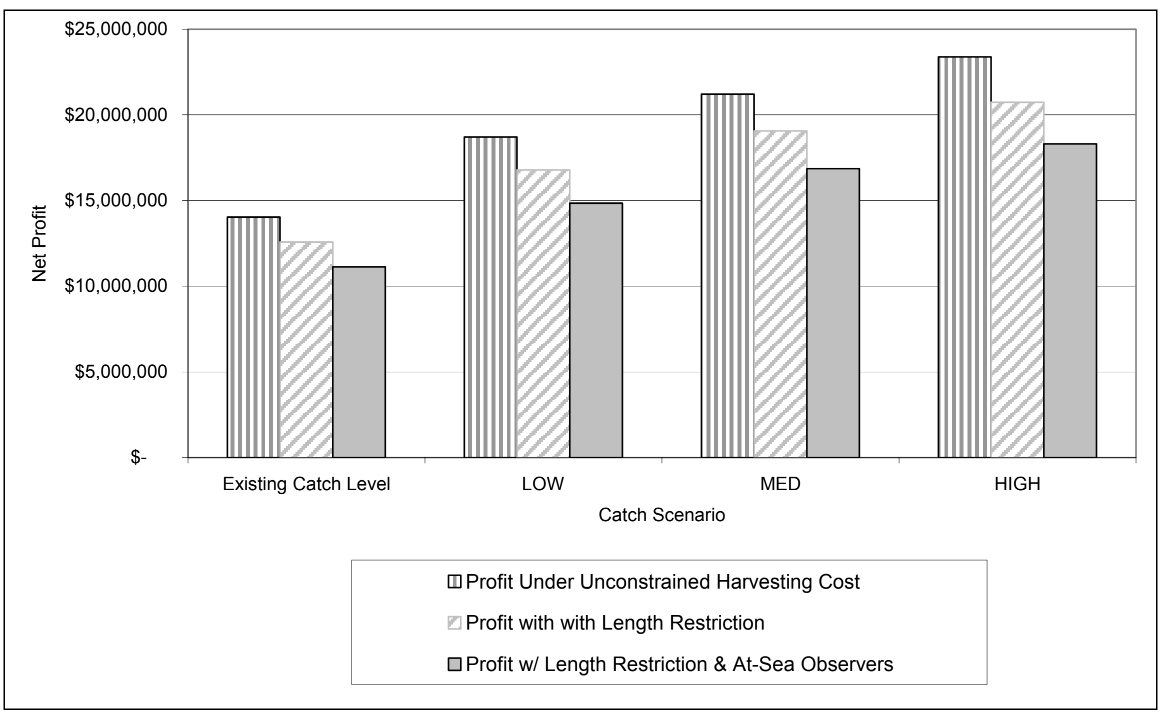


Figure 4–5. Estimated fleetwide profit in a rationalized non-whiting trawl fishery.

The above information shows that when potential cost savings are combined with the projected increase in gross revenue displayed in Figure 4–4, actual revenues to catcher-vessels and permit holders may increase by several million. Empirical evidence from other programs suggests that consolidation and the associated cost savings could occur quite rapidly after the fishery is rationalized.

The consolidation and cost efficiency model shows that the most efficient vessels for harvesting non-whiting trawl groundfish are approximately 60 to 70 feet in length. Smaller vessels tend to be limited by the effectiveness of harvest capacity per vessel size while larger vessels tend to operate in an area where costs are increasing more rapidly per scale compared to harvest effectiveness. Vessels that are larger or smaller may find it more profitable to sell quota shares and leave the fishery rather than remain in the fishery.

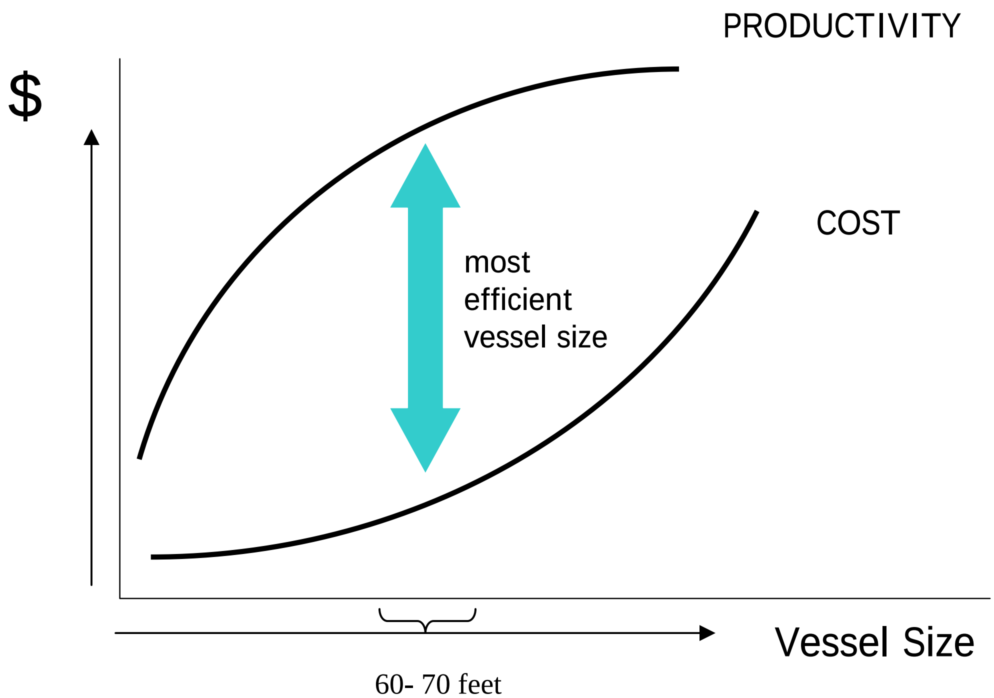


Figure 4–6. Conceptual description of vessel efficiency estimation.

The consolidation and profitability analysis assumes that harvesters of non-whiting groundfish will tend to specialize in that fishery. This is due to the concept of economies of scope, which means there is a cost of switching from one fishery to another, and there is a loss of efficiency associated with not specializing in one fishery. For fisheries where year-round opportunities exist, this specialization assumption is reasonable. However, for fisheries where there is a limited time window of resource accessibility, vessels are likely to participate in several different fisheries. Specialization in a time-constrained fishery would mean that a vessel would sit idle for several months of the year before and after the season, and this is cost inefficient. If the opportunity exists, vessels engaged in seasonal fisheries are likely to participate in other fisheries in order to keep those vessels operating. Since the Pacific whiting fishery is a fishery that has a limited time window of resource accessibility, those vessels are likely to participate in other fisheries. The fisheries they are most likely to participate in are those most appropriate for that particular vessel. In the case of Pacific whiting vessels, other fisheries are likely to be other trawl fisheries or crab fisheries because of the relative similarity of capital used to prosecute those fisheries. Many Pacific whiting vessels participate in the Bering Sea pollock fishery and are likely to continue doing so if the Pacific whiting fishery is rationalized. However, some vessels may elect to participate in the non-whiting trawl fishery. Since the non-whiting fishery consolidation analysis assumes that the non-whiting fleet will be composed of non-whiting fishery specialists, such diversification of Pacific whiting catcher vessels into the non-whiting fishery makes the non-whiting fleet consolidation estimates somewhat uncertain and should therefore be treated as order of magnitude estimates.

Changes in geographic distribution and timing of harvest

Distributional and geographic effects will almost certainly occur as a result of rationalization. Certain vessels may be more or less able to access their target species because of the geographic location of constraining overfished species. Vessels that traditionally operate in areas with relatively high bycatch rates may find themselves less able to prosecute target species activity relative to other vessels when they become individually accountable. This is because those vessels would be more likely to reach their QP of constraining stocks in any given year and be forced to stop fishing earlier than vessels operating in an area without the same relative presence of those constraining stocks. Since those vessels may find it more difficult to access target species, they may be more likely to sell quota shares to another vessel and leave the fishery, or move their operation to another port in order to access grounds where constraining stocks are less abundant. Such geographic considerations are likely to be influenced by market conditions as well. If a vessel fishes in an area with a relatively high bycatch rate of constraining overfished stocks, yet that vessel is economically efficient and delivers to a port with relatively good market conditions, then that vessel may continue to fish in that area regardless of the fact there is a relatively higher presence of constraining stocks in that area. The model that describes and estimates the result of these factors is described in more detail in Appendix C. The following table summarizes the geographic effect on fishing activities – and the vessels that fish in those geographic areas – that are likely to occur as a result of rationalization. These results are based on the regional comparative advantage analysis contained in Appendix C.

Table 4-5. Geographic effect of rationalization on catcher-vessels in the non-whiting trawl fishery.

Area	Effect on Vessels from Rationalization
Northern Washington Coast – Shoreward of the RCA	Highly likely that vessels fishing this area will be geographically disadvantaged by rationalization because of relatively restrictive bycatch conditions, relatively poor market conditions, and relatively inefficient vessel sizes.
Central and Northern Oregon Coast – Seaward of the RCA	Vessels fishing in this area may need to be relatively more selective about fishing practices because of bycatch concerns, but are not likely to move dramatically because of relatively beneficial market conditions.
Southern Oregon Coast – Shoreward of the RCA	Vessels fishing in this area may be forced to alter fishing behavior and location to a greater degree than vessels in other areas because of bycatch conditions.
Central California Coast – Shoreward of the RCA	Vessels fishing in this area may need to alter behavior to some degree because of bycatch conditions, but are not likely to move dramatically because of beneficial market conditions in the area.
Other Areas of the Coast	Vessels in other areas are likely to see liberalization of trawl fishing activity relative to status quo because of relatively lower bycatch rates, relatively more beneficial market conditions, or some combination thereof.

Regional differences in bycatch rates may also encourage vessels to use other legal groundfish gear to prosecute their fishing opportunities. Since different gear types have different relative rates of bycatch, some vessels operating in high bycatch areas may choose to use pot gear for example instead of trawl gear. In addition to these regional differences in bycatch rates as a motivation for using different gears, other vessels may choose to use another gear in order to capitalize on different markets, or they may choose to use trawl gear during certain times of the year and non-trawl groundfish gear during another time of year. Such gear switching may be driven by an attempt at capitalizing on economic opportunities, but it may also be driven by political motivations, social considerations, or public relation issues.

The flexibility that non-whiting trawl harvesters have under rationalization to fish when they please is greater than status quo. Although harvesters have flexibility under status quo because of the 2-month limit structure of the fishery, that flexibility only exists within that 2-month period. Issuing IFQ for groundfish species allows harvesters to engage in fishing operations as they please throughout the course of the year to take advantage of such things as variations in the price paid for harvested species. The following figure shows the average price per pound paid for select trawl target species. While this information may not suggest a clear seasonal pattern, it does illustrate that variations in the price per pound for groundfish occur throughout the year, and this information lends itself to suggesting that harvesters may vary fishing practices to some degree to capitalize on periods of higher prices. Allowing this flexibility in harvest timing works at enhancing opportunities for generating profits.

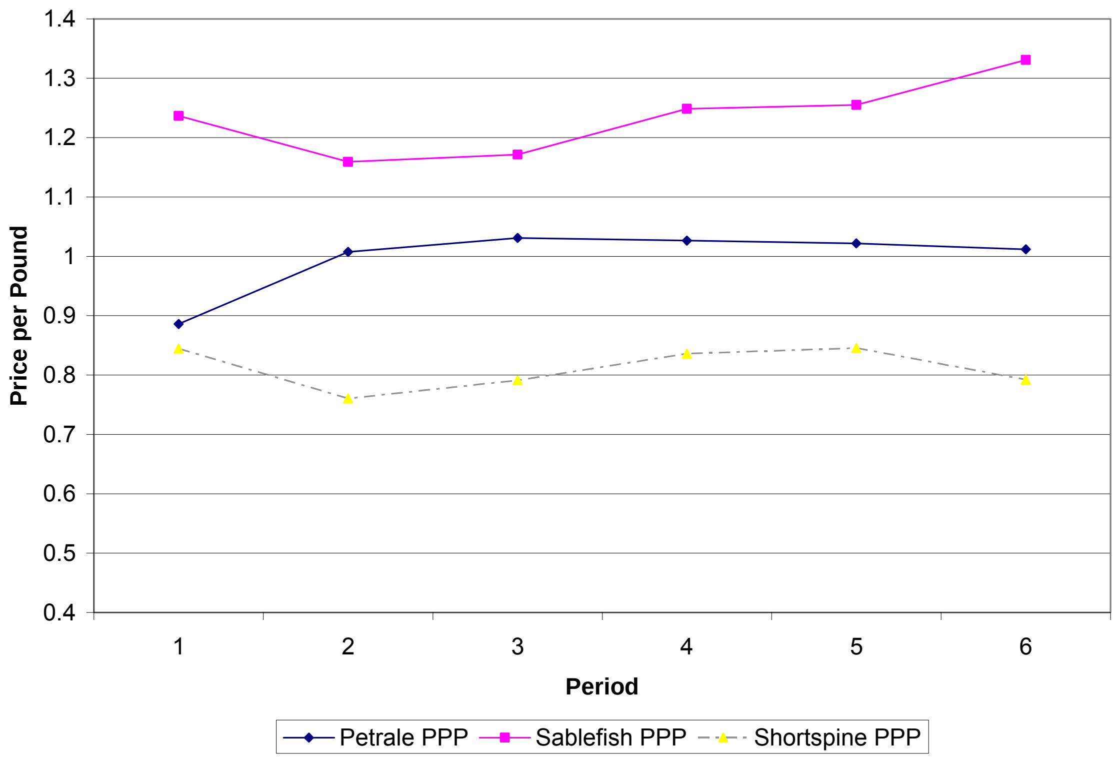


Figure 4–7. Average Price per Pound for Select Target Species Caught with Trawl Gear (2004-2007).

Gear switching

In addition to the flexibility in harvest timing created by an IFQ program, the gear switching provisions allowed for an IFQ program further enhance flexibility. Such gear switching may be used to balance catch accounts (because different gears have relatively different catch rates), take advantage of differing market opportunities, or to respond to public relations issues. Although difficult to predict, some information suggests that there are harvesters located in different sections of the west coast that are more likely to engage in gear switching on a permanent basis. Harvesters located in the central and southern-central California coast have expressed a desire to switch from trawl gear to groundfish fixed gear (longline and pots) in recent years because of public relations issues and because consumers in central and southern California appear to prefer non-trawl caught fish. In addition, harvesters that have typically relied on areas that have relatively high rates of constraining species bycatch may be more likely to switch to a non-trawl gear to avoid those constraining stocks since many types of fixed gear have lower bycatch rates of overfished stocks than trawl gear. This may encompass harvesters located in northern Washington and some harvesters in southern Oregon ports. Other factors may cause harvesters to temporarily use non-trawl gear to prosecute fishing activities during certain times of the year. This may be due to market conditions where there is a noticeable differential in the prices paid for groundfish species caught with one gear versus another. This is particularly the case for sablefish. The figure below shows that there is a substantial price differential between fixed-gear-caught sablefish and trawl-caught sablefish. If the trawl sector harvests 10 percent of the trawl allocation with fixed gear, this would increase exvessel revenues by approximately $600,000. If 20 percent of the trawl allocation was caught with fixed gear, exvessel revenues may increase by $1.2 million.

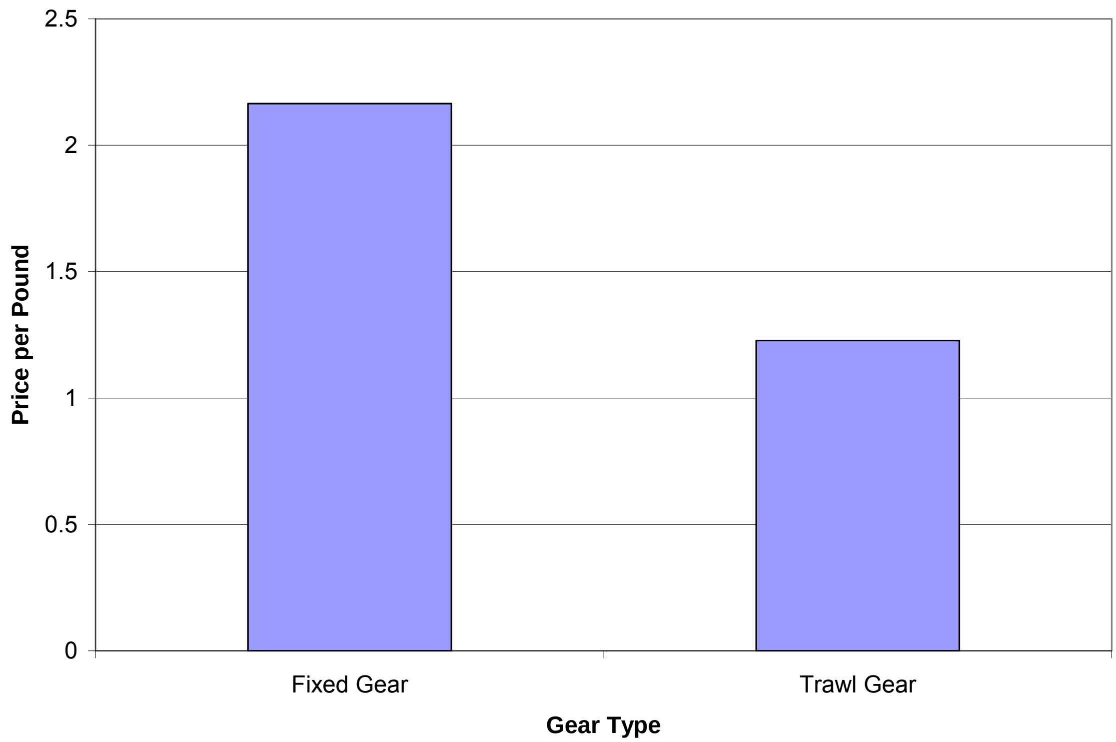


Figure 4–8. Average price per pound for sablefish by gear type (2004 - 2007).

Another factor influencing gear switching, aside from the price differential, is the ability to harvest some types of groundfish with trawl gear that cannot be caught with non-trawl gear. Harvesters in many areas are not likely to abandon trawl gear completely because doing so would mean giving up the catch of many species of flatfish, which are not easily caught with non-trawl gears. In other words, in many areas of the coast, harvesters may use non-trawl gear to target species such as sablefish during certain times of the year and use trawl gear to prosecute petrale sole, Dover sole, and other flatfish during other times of the year. The relative catch rate – under status quo conditions – for bottom trawl and fixed gear is shown in the table below. This information shows that fixed gear is successful at catching sablefish, shortspine thornyhead, and arrowtooth to some degree, but is not productive for catching many types of flatfish. Trawl gear on the other hand is capable of catching all of the species listed in the table. The reason these flatfish are not successfully caught with hook-and-line gear is because of their feeding patterns. While many longline fishermen may use herring with large hooks for example, several of the flatfish shown below feed on small prey, like worms, and have mouths too small to be caught with many of the hook sizes currently used. This information implies that large-scale gear switching may result in several species of flatfish being left unharvested.

Table 4-6. Catch of select groundfish by gear type, mt (2006).

Species	Non-whiting trawl	Fixed Gear
Sablefish	2,654.3	3,119.3
Shortspine	648.7	178.1
Longspine	821.3	21.2
Dover sole	7,475.5	4.6
Petrale sole	2,690.1	4.1
English sole	1,291.4	0.0
Arrowtooth flounder	2,817.6	78.8
Other Flatfish	1,854.9	4.1

4.7.2.2 *Impacts to Groundfish Trawl Harvesters in the Mothership and Shorebased Whiting Fishery*

The effect of rationalization on whiting catcher vessels is more difficult to estimate and is more likely to be a result of improved product quality, slower-paced harvest activity, increased yield (which should increase exvessel prices), and enhanced flexibility and ability for business planning. Some consolidation may occur in these sectors, though the magnitude of consolidation is expected to be relatively minor in comparison to the non-whiting trawl fleet.

Consolidation

Using historic performance of catcher vessels in the shoreside and mothership sectors in the whiting fishery as a guide, the productive potential of catcher vessels in each sector can be estimated. Depending on the season length of a rationalized fishery, the number of vessels that would remain in each sector can be calculated. Assuming status quo season lengths, whiting OYs equivalent to the 2007 year, and the production potential of vessels based on historic data, information suggests that the number of catcher vessels in the shoreside sector may be approximately 20 vessels and the number of catcher vessels in the mothership sector may be approximately 12 vessels[18] after the fishery is rationalized.

[18] The assumptions used in developing these estimates are: A) shoreside catcher vessels catch an average of 100,000 lbs of Pacific whiting per day during an 84 day season; and B) that catcher-vessels in the mothership sector catch an average of 140,000 lbs per day during a 56 day season.

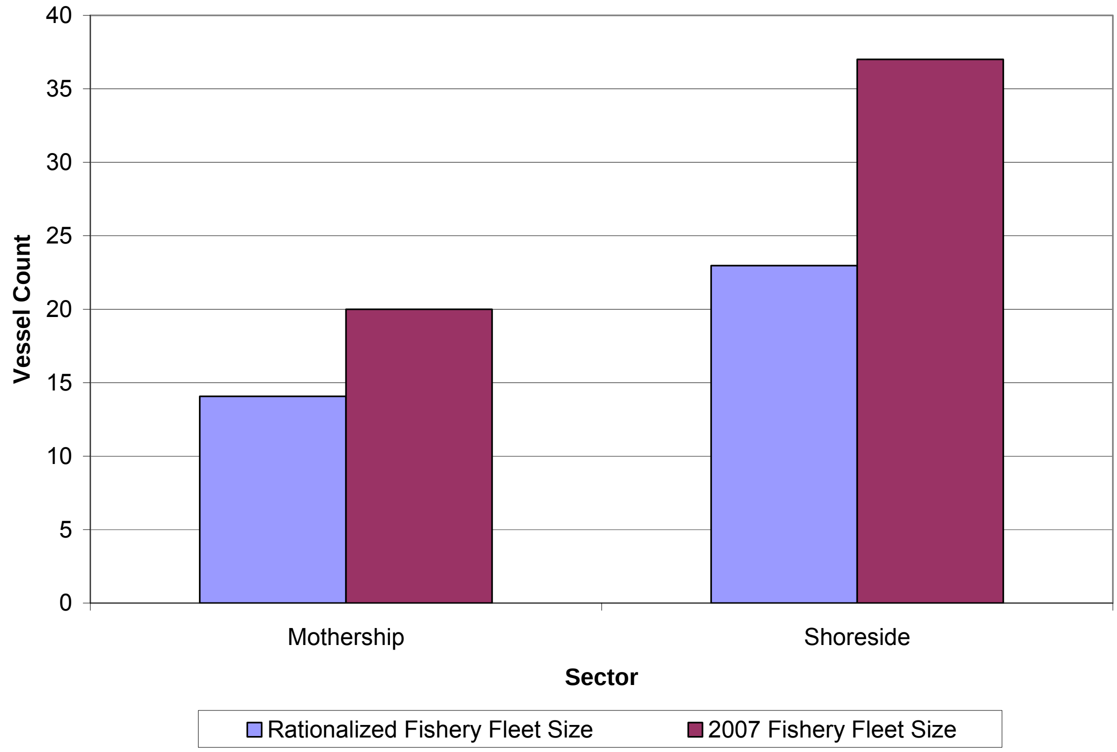


Figure 4–9. Order of magnitude estimates of catcher vessel fleet size in the whiting fishery.

Consolidation in the shoreside and mothership sectors of the whiting fishery should result in cost reductions and increased profitability. However, cost-earnings data are not readily available for estimating such cost savings, and therefore estimates showing improvements in profitability are not possible for this group of harvesters.

While net revenues per boat in the whiting fishery cannot be readily calculated, estimates of gross revenue can be derived using the fleet consolidation estimates and a set of assumed U.S. whiting OYs and exvessel prices. Using exvessel prices and OYs from the 2007 fishery, an estimate can be derived for gross revenue per boat in the shoreside and mothership whiting fishery. The following figure illustrates these estimates. This figure shows that catcher vessels in both the shoreside and mothership whiting fishery may be expected to generate slightly over $400,000 on average under status quo management conditions (assuming the entire US OY is harvested) while the average vessel may be expected to generate approximately $800,000 after the fishery is rationalized and fleet consolidation occurs.

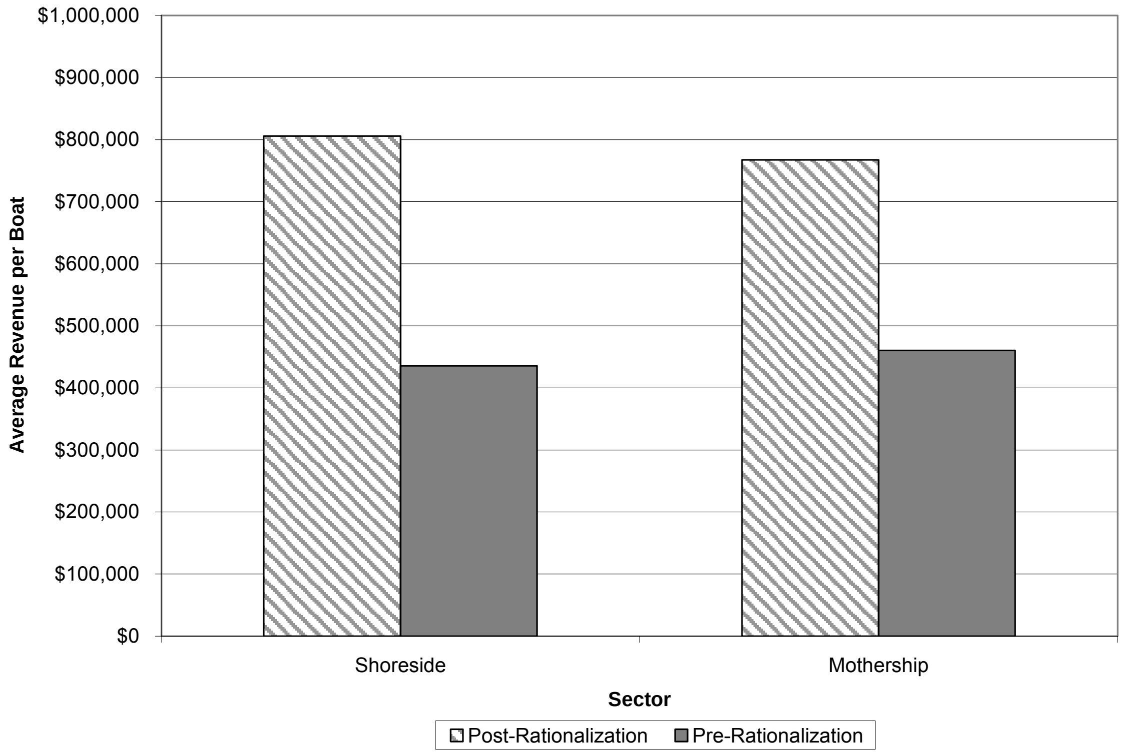


Figure 4–10. Average gross revenue per vessel in the whiting fishery (assuming 2007 OY and exvessel prices).

Product quality improvements

Empirical evidence has shown that substantial increases in product recovery have occurred after other rationalization programs went into effect. An increase in product recovery should increase profits in the industry and those profits are likely to trickle down to catcher vessels in the form of higher exvessel prices. The Pacific Whiting Conservation Cooperative reports that product recovery increased by 40 percent after the voluntary co-op was formed {Waldeck, 2008}. In the Bering Sea Pollock fishery, product recovery increased from 19.5 percent to 29 percent in the best year (for a 48 percent increase) after the formation of the Pollock Conservation Cooperative {Wilen and Richardson, 2003}.

While substantial increases in product recovery have occurred after other programs were rationalized, it is not necessarily reasonable to assume that those same increases will occur in the at-sea portions of the Pacific whiting fishery. In the mothership portion of the whiting fishery, substantial increases in pollock product recovery came about as a result of modifications to processing capital that occurred after implementation of the American Fisheries Act. The motherships that participate in the Pacific whiting fishery also participate in the pollock fishery, and therefore gains in product recovery in the Pacific whiting fishery have already occurred because that same (improved) capital is being employed off the Pacific Coast in the mothership whiting fishery. However, given that portions of the Pacific whiting fishery function as an Olympic fishery with little opportunity for business planning, increases in product recovery may occur because of a slower pace of harvesting, flexibility, and an ability to more selectively process harvested species, and this may increase the exvessel price that whiting catcher vessels receive for their catch.

Seasonal and geographic changes in the fishery

To some degree we would expect the whiting fishery to operate over a longer time period as the fleet is rationalized and prosecutes the fishery in a more strategic manner, though this is tempered to a large degree by the availability of the Pacific whiting resource, the level of participation of Pacific whiting vessels in other fisheries, such as Alaska pollock, and the timing of those fisheries. In addition, certain sectors of the fishery are time and geographically constrained. Experience with fishing patterns exhibited by catcher vessels in the shoreside sector of the whiting fishery indicates that it may not be feasible for those vessels to fish in the fall months because the type of vessels and nets employed in that sector limits access to the resource.[19] This may be the same for mothership catcher vessels, though available information and experience with the fishery makes this point less clear. Catcher vessels in the shoreside sector are geographically constrained because of the north/south distribution of whiting processing plants. In order for vessels to make deliveries to those plants, those vessels have to fish in nearby areas off central Washington, southern Washington, Oregon, and northern California. Since the Pacific whiting resource migrates north during the course of the year, this geographic limitation of the processing plants – and the need to land deliveries to those plants before the whiting spoils – restricts the time of year when shoreside catcher vessels can prosecute the fishery. If historic patterns are a guide, shoreside fishing operations may be prosecuted successfully during months prior to October. Beginning in October it is less clear whether shoreside vessels can successfully prosecute the whiting resource.

While resource timing and delivery location may constrain the time window for prosecuting the shoreside whiting fishery, there are reasons to prosecute the whiting resource later in the year. Larger whiting are caught later in the year, one of several traits that are desirable to consumers. Published research has demonstrated that quality – and price – increases as whiting are harvested later in the season {Larkin and Sylvia, 1999}. Therefore, to some degree we would expect both the shoreside and mothership sectors of the whiting fishery to fish longer and/or later in the year to take advantage of these improved market conditions.

4.7.2.3 *Risks Imposed by Bycatch Species and Thin Markets for IFQ*

While information suggests revenue could be increased substantially under rationalization, substantial risk to non-whiting trawl harvesters may be associated with an IFQ-based program. This risk comes from two sources: individual accountability and thin market conditions. Individual accountability is a source of risk because of the uncertainty that is associated with fishing and the fact that, for some species, accidentally exceeding quota pounds may be extremely costly to individual harvesters because of the cost of purchasing enough quota to cover that deficit, or the fact that that the vessel may be required to forego future fishing opportunity because of an enforcement action. A "thin market" for IFQ could occur when allocations of some groundfish species are so small that there are a very limited number of suppliers. Such conditions often lead to volatile price fluctuations (of quota in this case) and quota transactions that involve strategic behavior. The effect of thin market situations can create cases where the market is not able to reach equilibrium and transfers occur based on mechanisms other than market mechanisms (such as personal relationships). In addition, thin market conditions are related to the risk posed by individual accountability. Thin markets may make it problematic for vessels to actually find quota to cover catch deficits, and this poses a financial risk to harvesters.

[19] It is generally accepted that Pacific whiting change their distribution as the year progresses. This change is reflected latitudinally and by depth. Fishers that operate Pacific whiting catcher vessels have indicated that they have trouble successfully targeting Pacific whiting during later months of the year because their equipment does not allow them to fish at depths where the whiting are located.

The following table outlines the species which may be the source of risk posed by thin market conditions under an IFQ-based program. This table is based on the assumption that allocations made to the trawl sector will be similar to the amount of catch that occurs under status quo management. While allocations could be made that grant more pounds to the trawl sector, these species are fully allocated, meaning any increase in trawl sector take would mean a reduction in the take of other sectors. Given the fact that many of these species are targets of the other sectors, a substantial change in the allowable take by the trawl sector seems unlikely. If these species create a great enough set of risks to harvesters, the response may be an avoidance of fishing activity in areas shoreward of the RCA.

Table 4-7. Species for which thin market conditions may exist in an IFQ program.

Thin Market Species in Non-Whiting Sector	Thin Market Species in the Whiting Sectors
Canary	Lingcod S of 42° N. latitude
Cowcod	Pacific Cod
Yelloweye	Pacific Ocean Perch
Longspine S 34°27’	Chilipepper
Minor Nearshore Rockfish N	Bocaccio
Minor Nearshore Rockfish S	Splitnose
Black Rockfish (WA)	Shortspine
Black Rockfish (OR-CA)	Longspine
California Scorpionfish	Cowcod
Cabezon	Yelloweye
Kelp Greenling	Black Rockfish (WA)
	Black Rockfish (OR-CA)
	Minor Nearshore Rockfish N
	Minor Nearshore Rockfish S
	California Scorpionfish
	Cabezon
	Dover Sole
	English Sole
	Petrale Sole
	Arrowtooth
	Starry Flounder
	Other Flatfish
	Kelp Greenling
	Longnose Skate

Note: If three whiting sectors are established and the shoreside whiting and non-whiting use common quota, the thin market species for the shoreside whiting sector would be the same as the species in the non-whiting column.

Cabezon specifications are specific to waters off California. This species is not found outside state waters and California has prohibited LE trawling in state waters, which calls into question the necessity of establishing trawl IFQ for these species. Kelp Greenling harvest specifications are specific to waters off Oregon and are set outside the Council process by the state of Oregon, which raises questions about how quota pounds would be issued. Furthermore, several species in the whiting column do not extend into the waters where the whiting fishery takes place; and therefore there is some question about the necessity of establishing IQ for these sectors in the whiting fishery. These species include lingcod south of 42° N latitude, cowcod, minor nearshore rockfish south, cabezon, and bocaccio.

Whether the risk is great enough to have a noticeable impact on the outcome depends in part on the amount of quota pounds available to each harvester and the type of catch limit (either total catch or landed catch). Table 4-7 list species for which this risk appears relatively great under an IFQ program because of thin market conditions. Under status quo conditions, the comparatively lower level of risk is a result of catch limits that are based on landed catch (therefore harvesters can avoid penalties by discarding catch in excess of catch limits) and the size of the 2-month limit. In a rationalized fishery, catch limits will be total-catch-based (harvesters cannot avoid penalties by discarding) and it is likely that the size of IFQ available for each vessel could be much smaller than the 2-month limits currently available to each fishery. To illustrate this effect, we show the existing 2-month limit for nearshore rockfish species in the trawl fishery against the amount of IFQ available to each vessel (on average) to constrain harvest to status quo levels. For reference purposes, status quo harvest of nearshore rockfish in the non-whiting trawl fishery is approximately 1 mt annually (compared to a northern OY of 142 mt and a southern OY of 564 mt). Figure 4–11 shows that the current 2-month landing limit of nearshore rockfish is 0.14 mt (300 lbs) per 2-month period. To constrain the trawl fishery to a 1 mt total catch of nearshore rockfish in an IFQ program, the average vessel would receive 0.009 mt (19 lbs) of nearshore rockfish quota for an entire year. Though the actual magnitude will differ for each of the species listed in the table above, the concept shown below would hold for almost each case: the 2-month limit currently specified for those species will be substantially higher than the amount of IFQ available to each vessel to maintain the same harvest. The exception is where existing 2-month limits are zero (cowcod).

The reason for the difference between the size of the cumulative catch limit and the likely size of an IFQ allocation is that cumulative catch limits are often constructed in a manner that limits few – if any – vessels, but may allow targeting of various other stocks while discouraging targeting on these nontrawl stocks. In the case of nearshore rockfish species, the existing 2-month limit clearly discourages targeting, but is not so small as to result in much regulatory discard. The result, however, is that the total catch varies to some degree from year to year. In an IFQ program designed to maintain the same level of catch, that level of catch is divided among participants in the fishery in such a way that the total amount of quota pounds available to the participants equals the overall level of catch allowed for that sector.

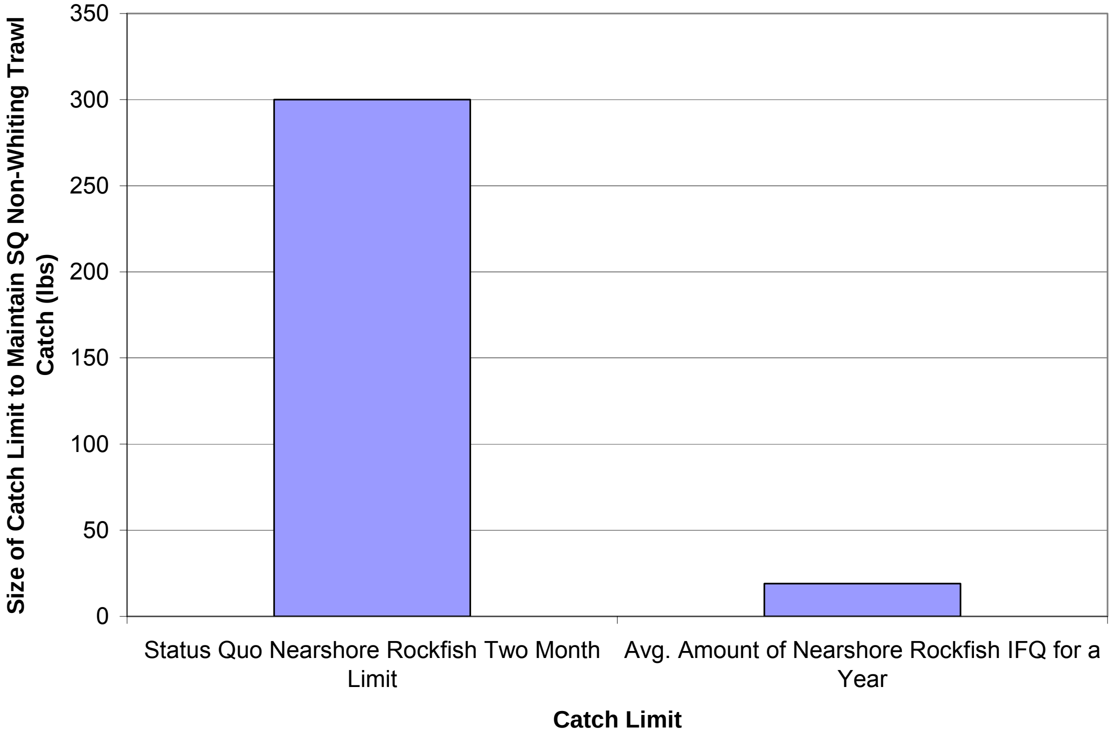


Figure 4–11. Size of catch limit necessary to maintain status quo catch of nearshore rockfish in non-whiting trawl fishery.

In addition to the size of the cumulative limit, the actual quantity of nearshore rockfish landed with trawl gear is small. We examine black rockfish landed with trawl gear on a per-vessel basis since this is the most frequently encountered nearshore species and find that the occurrences of black rockfish landed with trawl gear is small, and the size of those occurrences is also typically small (less than 83 lbs in any given period). Most landings made with trawl gear have no black rockfish. However, of those vessels that have landed black rockfish over the 2004 – 2007 period, most have been between 1 and 83 pounds over a two month period. This is evidenced in the figure below illustrating that there were 61 occurrences over the 2004 – 2007 time period with vessels that have landed between 1 and 83 pounds of black rockfish during a given period.

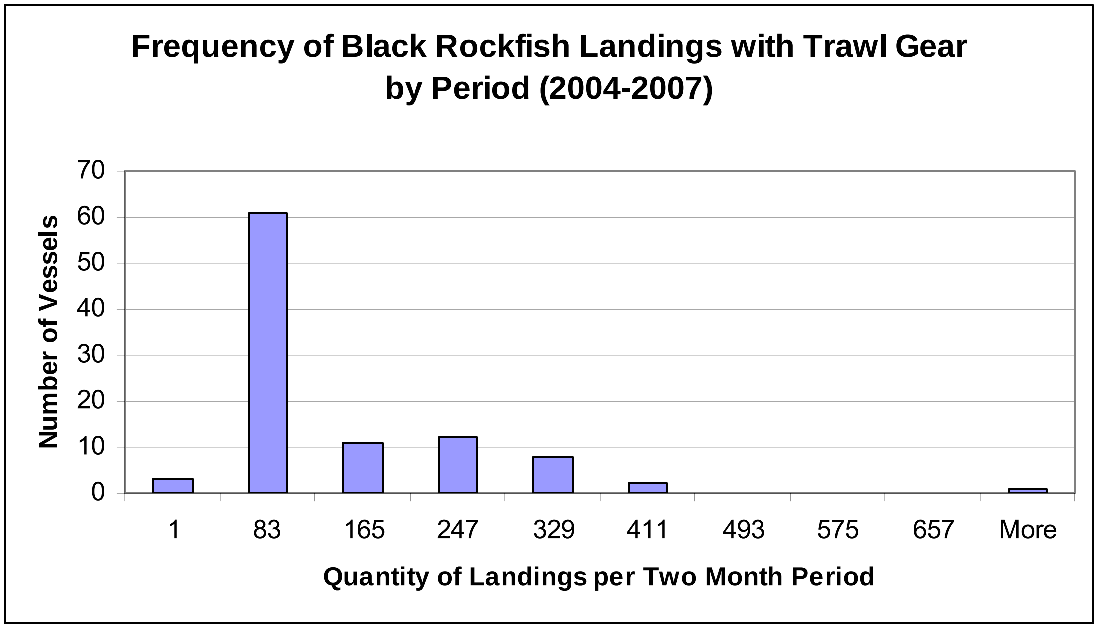


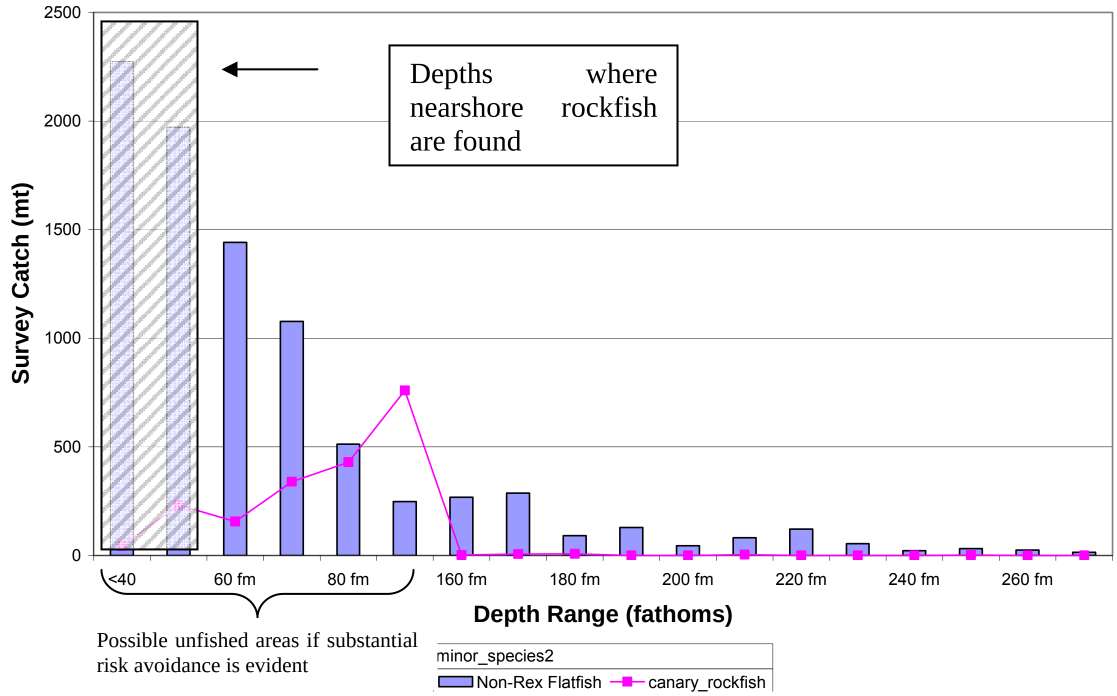
Figure 4–12. Frequency of Black Rockfish Landings with Trawl Gear by Period (2004 – 2007)

The recent catch of several nearshore species in the trawl sectors is shown in the table below. This information is shown against the 2008 OY for each stock to provide an indication of the scale of trawl catch relative to the OY.

	2006		2005		2008 OY
	Non-Whiting Trawl	Whiting Trawl	Non-Whiting Trawl	Whiting Trawl	
Black rockfish	5	0	1	0	1,262
Other Nearshore rockfish N	3	0.1	1	0	142
Other Nearshore rockfish S	0	0	0	0	564
Cabezon	0	0	0	0	69
Kelp greenling	0	0	0	0	NA

If the risk posed by individual accountability of low trawl allocation species is great enough, trawl vessels may avoid areas altogether, foregoing target species opportunities that exist in those areas. Interestingly, the thin market species for the non-whiting trawl sector shown in the above table are predominately found in the nearshore areas and along the continental shelf areas within, or shoreward, of the RCA. If the average vessel receives small quota pounds for some, or all, of these species they may very well forego target species opportunities in those same areas because the risk of encountering these low allocation species is too great. The socioeconomic effects of the fleet foregoing harvests of associated target species are a reduction in exvessel revenue and catch from what is expected, fewer vessels than expected, and fewer fishing related jobs. The biological effect depends on policies established in response to such changing catch levels, however, it is reasonable to expect that foregoing harvest of target species will increase their abundance.

The following figure is intended to demonstrate why some target species may not be accessed if the risk posed by low trawl allocation species is large. This figure shows the abundance of "other flatfish" excluding rex sole in the trawl survey by depth.[20] This is plotted against the abundance of canary rockfish and minor nearshore rockfish by depth. This information suggests that, given enough risk posed by individual accountability of nearshore rockfish and canary rockfish in an IFQ-based program, the trawl fleet may forego the catch of "other flatfish" because they are found in the same areas. Catch of other target species is likely to be foregone as well if vessels avoid areas shoreward of the RCA (including petrale sole during summer months); however, the following figure is meant to illustrate the risks posed by managing some species with IFQ.



Source: NOAA Fisheries trawl survey data.

Figure 4–13. Abundance of select groundfish species by depth.

The individual accountability of low allocation species creates a risk to harvesters where there is a relatively large potential for harvesters to encounter stocks, but a relatively small amount of quota available. This concept is weakly differentiable from thin market conditions because the number of transactions could presumably be large. Where the risk posed by accountability of low allocation species differs from thin market conditions is where the number of transactions of quota pounds is large enough to avoid price volatility that is present in thin markets. The implication of low trawl allocation species is that the demand for quota of those species is likely to be high relative to supply, thus making the cost of purchasing quota of those species high. The risk posed by thin market conditions and low allocation species with relatively high probabilities of encounters may end up being the same (high costs of acquiring quota); however, the species may be different. For example, a species like darkblotched rockfish may have enough quota available, and be encountered enough, that transactions occur in a manner that is sufficient to avoid thin market conditions. However, demand may be large relative to supply and therefore the cost of this quota may be relatively high. In this case, the market is likely to

[20] Rex sole was excluded because it is found across a much wider depth distribution, and therefore the catch of rex sole may not be affected.

work effectively because the number of transactions may be large enough to avoid thin market conditions, but the cost to individual harvesters trying to purchase quota could be substantial.

The sources of risk identified above pose risks to individual entities, but they also pose a collective risk to the entire fleet. Given the uncertainty about what will be caught when deploying fishing gear, there may be a potential for a harvester to have a "disaster tow" where a single haul catches the remaining trawl sector allocation. The alternatives under consideration would require that when the trawl sector allocation is reached or exceeded, large areas of the coast may be shut down to prevent further harvests of those species. This action will almost certainly prevent further harvest opportunities for vessels and several target species. If there is an expectation that disaster tows will occur, then the fishery may begin to take on the characteristics of an Olympic fishery where harvesters begin fishing operations in January and attempt to harvest as much of their quota as they can before one harvester preempts future opportunity through an unexpected disaster tow. Another potential outcome of these risks is that the fleet may completely avoid certain areas and forego harvest opportunities for target species in those areas. This would tend to reduce exvessel revenues from those expected.

One factor in the alternatives that may mitigate some of the risk is the presence of a carry over provision. This provision would allow harvesters to debit an overage from a subsequent year and avoid the purchase of costly quota and avoid a possible enforcement action. Another way of managing risk in an IFQ-based program is for harvesters to form voluntary pools for sharing quota and spreading the risk of unexpected catch events. It can be reasonably well expected that this will happen to some degree, however, two provisions that may make it difficult to form such voluntary pools is the manner in which quota is initially allocated and whether there is the presence of a grandfather clause for constraining stocks. The management of risk by harvesters can be affected by initial allocation and by the presence of a grandfather clause. If harvesters rely on collective, voluntary pooling arrangements to collectively manage low trawl allocation species, then the initial allocation may influence the success of those pools forming. The formation of such collective arrangements relies on potential participants having relatively even power in the negotiations that occur while forming such collective agreements. Such even power does not necessarily mean that all collaborators should have equal allocations of all species, but it does mean that if one collaborator has a large amount of low allocation species, that harvester will be at a relative advantage in the negotiation. If initial allocation favors some harvesters more than others, or a grandfather clause allows some entities to hold more constraining species quota than others, the ability of those harvesters to form risk pooling arrangements may be problematic. This is because the outcome of negotiations would tend to favor fewer individuals (those with more negotiating power). Such an outcome would tend to break-down collective agreements that are intended to treat individuals equitably and result in risk sharing.

In a co-op program, the type of risk described above is minimized through collective management that spreads the risk across the multiple participants in the co-op or fishery. However, if the risk is spread across too many participants, the ability of those participants to agree to a bycatch management plan may be jeopardized and there is a potential for a "race for bycatch" to develop among harvesters.[21] The risk that a race for bycatch may develop depends on the number of co-ops or sectors that a bycatch limit applies to. If a bycatch limit is applied to a relatively small pool of vessels (e.g., to individual co-ops) the possibility of a race for bycatch developing is relatively small. Conversely, if a bycatch limit is applied at a relatively gross level (to all three commercial whiting sectors combined), it is much more likely that a race for bycatch would develop. However, other risks become evident if bycatch limits are

[21] The term "race for bycatch" is used in this case to describe a type of behavior that occurs when harvesters do not believe that the bycatch limit will be successfully managed. In this event, harvesters believe that they face the risk of being preempted by the attainment of a bycatch limit and therefore race for fish in order to harvest their allocated target species.

established for a relatively small group of vessels. The risk of an unexpected disaster tow preempting the harvest opportunities of harvesters in a co-op is greater if the bycatch limit is established for a relatively few number of harvesters. This type of risk can be managed through the presence of inter-cooperative agreements to manage bycatch. A fishery operating with such agreements would likely rely on the individual co-op agreements to specify the management of bycatch of individual harvesters (thus imposing individual accountability for bycatch) and rely on the inter-co-op agreement to spread the risk of catch uncertainty across more participants. While this type of framework appears similar to IFQ-level management of bycatch, the presence of bycatch species quota in an IFQ program can potentially stand in the way of collective management agreements. This is because those holders of bycatch quota would tend to have a relatively greater negotiation stance. This concept is discussed in more detail under the earlier section comparing cooperative institutions with individual quota institutions.

Level of Bycatch Management	Collective Risk (risk of a race for bycatch)	Individual Risk (risk posed to individuals from catch uncertainty, low trawl allocation and thin market species, and individual accountability)
IFQ	Low	High
Co-op Level	Med-Low	Med-High[22]
Sector Level	Med-High	Med-Low
Fishery Level	High	Low

A program that requires whiting catcher vessels to cover low OY and low trawl allocation species with quota will almost undoubtedly create a thin market for IFQ. As described above, including these species in a program creates risk because vessels that exceed their holdings of quota pounds for one of those species may find it difficult to purchase quota pounds to cover those overages. If quota pounds cannot be found or acquired, that vessel may incur a substantial penalty. This places a high burden on the individual which may be appropriate if the situation warrants such a threshold. In a cooperative program, such thin market conditions are unlikely since non-target species will be covered by a collective bycatch limit that does not rely on market mechanisms, but rather relies on social arrangements and relationships. Pooling of non-target species in this manner alleviates some of the individual burden in favor of risk sharing across participants in the fishery.

4.7.2.4 *Other General Effects of Rationalization on Trawl Harvesters*

While it can be reasonably well expected that individual accountability measures and an elimination of an Olympic fishery will increase exvessel revenues in the fishery (risk conditions aside), changes in the way the fishery is prosecuted will be a likely result. In the non-whiting portion of the trawl fishery, vessels are likely to modify their behavior in several ways in order to decrease bycatch of overfished species. This may come in several forms including gear modifications, using a different type of gear altogether (i.e., non-trawl gear), or changing the location of fishing. Changes in the location of fishing effort are likely to be driven to a large degree by the relative presence of constraining stocks and the fact that those stocks tend to be patchily distributed. As vessels become individually accountable for their catch of constraining stocks, they are likely to move from those patches where there is a relatively high

[22] If inter-cooperative agreements are formed for managing bycatch across co-ops, a co-op level allocation of bycatch species may have a low level of risk posed by individual accountability and catch uncertainty, while also having a low level of risk that a race for bycatch could develop. This is because a co-op level allocation of bycatch forces the cooperative to internalize bycatch management and this would be evident in the cooperative agreement signed by harvesters in that cooperative. Such internalization of bycatch management in the co-ops would tend to foster the development of high levels of individual accountability for bycatch by members. Allowing inter-cooperative agreements to form would allow cooperatives to spread the risk of catch uncertainty across cooperatives (thus reducing individual risk) if those cooperatives can agree to terms.

abundance and bycatch rate, and if that distance is substantial, this may have repercussions on adjacent communities that are dependent on trawl fishing activity. This effect is described in more detail under the community impacts section.

Consolidation of the trawl fishery will almost certainly be another outcome of rationalization. A reduction in fleet size is likely to be non-homogenous across the fleet, meaning that there are vessels and operators with certain characteristics that may make them more or less likely to drop out of the fishery when a rationalization program goes into place. This consolidation should increase efficiency and net revenues and may also result in increased wages to those employed on fishing vessels. However, it is also likely to result in fewer fishing-related jobs and a disproportionate reduction in the number of vessels in some ports, with potentially adverse impacts to input suppliers, processors, and other fishing support businesses in those places. This effect is further described in the analysis of impacts to captain and crew, impacts to processors, and impacts to communities.

Initial allocation

The initial distribution of quota is likely to have an effect on groundfish trawl harvesters. While this is primarily a distributional issue, some research suggests that variations in overall economic performance could occur depending on the way quota is allocated {Hurwicz, 1995}. Overall economic performance could be affected because of the transfer costs associated with finding and trading quota, and also because of the relative amount of financial assets fishermen have to purchase quota, which may limit their ability to acquire additional quota. Economic performance may be compromised if the initial allocation to harvesters differs substantially from their current and recent fishing practices.

This initial allocation creates something like a capital asset and also influences the amount of harvest available to those individuals. Depending on the allocation formula, some permit holders and catcher vessels may receive a greater or lesser amount of allowable catch than under status quo conditions. In addition, they may receive a different mix of species allocated as quota compared to the mix of species they currently harvest. In the long run, transfers of those fishing privileges should occur in a way that is more optimal to individual harvesters, and that transfer will act as a cost to those that purchase the shares and as a benefit to those that sell them.

Rationalization and the distribution of harvest privileges may disadvantage people that currently own and/or operate vessels but are not groundfish trawl permit holders. This is because these people will not receive an initial allocation of quota. The consolidation of harvest privileges (be it IFQ or co-ops) onto fewer vessels may put those individuals without an initial distribution of harvest privileges at a relative disadvantage. They will be less able to pay quota holders to lease their unused quota compared to other quota holders wanting to lease it. This is based on the notion that vessel owners with an allocation of quota can cover their costs with their own quota and then bid higher prices to lease quota from others. Vessel operators without an initial distribution will need to cover their costs and generate revenues on quota they may lease from other individuals and this makes them less able to bid high prices to lease quota. Since holders of harvest privileges will want to get the best price, those vessel operators unable to pay it will be shut out of the market.

The share of quota initially allocated to harvesters and processors will tend to influence exvessel price. Exvessel price is generally expected to increase relative to status quo if the entire allocation of IFQ is made to permit holders. As processor initial allocation is increased, exvessel price is expected to decrease. It is not clear how this compares to status quo exvessel prices however. In the cooperative program proposed for the whiting sector, which has linkages between harvesting and processing entities, it is unclear what will happen to exvessel prices. In situations where there is one buyer and one supplier, prices are typically set by non-market mechanisms. Personal relationships are likely to play a great role in exvessel price setting in such cases.

Safety

Qualitative information has shown that safety on-board fishing vessels is generally improved as a result of rationalization. Typically this has been the result of an elimination of Olympic-style characteristics in fisheries; vessels no longer need to fish in hazardous weather conditions as often after the fishery is rationalized. Other reasons for changes in safety include the capability of vessel owners to adequately maintain vessels and safety equipment. This maintenance is directly associated with the amount of net revenue generated by fishery participants, and therefore, a fishery that experiences an increase in net revenue will likely experience a decrease in safety-related incidents. Since rationalization is generally expected to result in an elimination of the race for fish and an increase in net revenue across catcher vessels, it is expected that safety will be enhanced by rationalization of the west coast trawl fishery.

4.7.3 Effects of the Alternatives Revealed by Analytical Scenario

In addition to the general effects described above, each of the analytical scenarios is expected to impact catcher vessels and permit owners in different ways. The analytical scenarios result in different impacts because of variations in the elements of those scenarios. This section analyzes the direct and indirect impacts of the analytical scenarios on groundfish trawl harvesters.

In this section, we begin by describing the manner in which each of the elements of the analytical scenarios is expected to impact catcher vessels and permit owners. This description of expected effects serves as an overview and introduction to the way in which the elements of the alternatives will impact this particular environmental component. Immediately following the overview of how the elements of the analytical scenarios impact groundfish trawl harvesters is a description of the impacts of each analytical scenario. Where appropriate, these impacts are compared to status quo conditions and to the other analytical scenarios. Following the description of impacts of each analytical scenario is a comparative summary of the effects of each of the scenarios.

4.7.3.1 *Expected Effects of Elements of the Analytical Scenarios on Limited Entry Trawl Harvesters*

The effect of the analytical scenarios on limited entry trawl harvesters is evaluated in two ways. First, we evaluate the specific elements, or program features, that are varied across the analytical scenarios (these are the rows in the table describing the analytical scenarios). Second, the entirety of each analytical scenario is evaluated for its effects.

How do IFQs and co-ops change things relative to status quo for groundfish trawl harvesters?

Changing the primary catch control tool in the fishery to total catch IFQs and/or harvest co-ops is expected to impact groundfish trawl harvesters in a variety of ways. In general, shifting to IFQ and harvest co-ops will allow for harvesters to optimize the timing of their fishing practices in order to maximize net revenues. In addition, IFQs and/or harvest co-ops will tend to eliminate the Olympic characteristics of the whiting fishery and tend to facilitate the development of strategies that increase product quality and yield. Knowledge transfer between fishermen will tend to be greater than under status quo when the catch control tool is changed because they are no longer competing to catch the largest possible share of the OY. However, knowledge transfer and communication are likely to be different in IFQ programs compared to co-op programs. This is because harvesters in a co-op (be it a voluntary or mandatory cooperative) have more incentive to act collectively, which requires communication and information sharing for collective success. This may influence the degree of success fishers have in dealing with collective action problems such as bycatch avoidance and successfully targeting of desired species (Pacific whiting).

The individual accountability for total catch associated with IFQs and co-ops increase the financial risks that individual harvesters face when prosecuting fishing activity. This is particularly the case for vessels that may encounter species with low OYs and/or low trawl allocations. While theory suggests that fishers will simply avoid stocks which they do not have quota for, fishing is inherently an inexact method of extracting resources. This uncertainty means that there is a potential for harvesters to catch species that they may not intend to, or may in fact be attempting to avoid. If harvesters accidentally incur a catch deficit by exceeding their holdings of quota pounds, they will need to cover that deficit by purchasing additional quota. For species with low OYs and/or low trawl allocations, this quota may come at prices that are extremely expensive. This possibility creates a large risk to individual harvesters that are participating in an IFQ program. This risk does not necessarily exist to the same degree in a co-op system. In a co-op system, the risk of an unforeseen or unexpected catch event is spread across the co-op participants who collectively absorb that event.

IFQ may create more individual accountability than co-ops in some cases. This is partly because of the implications described above from encountering low OY species, or species with low trawl allocations. The fact that co-op members must internalize the unforeseen or unexpected actions of other co-op members to some degree tends to reduce the penalty individual harvesters must internalize from an unexpected catch event. This difference in individual accountability between the two systems is not likely to affect the outcome of the program if it is minor, but if the degree of individual accountability becomes too low, then a race for fish could ensue across all harvesters in a sector because of fear of preemption over bycatch. Alternatively, if the risk associated with the harvest of some species an IFQ program is too great, harvesters may forego the catch of some target species to avoid risk.

The imposition of IFQs and/or harvest co-ops as a catch control tool is likely to induce behavioral changes that influence the magnitude and type of species harvested in the fishery relative to status quo. This is because of the perceived reward–in the form of increased catch of target species–associated with reductions in the catch rate of constraining overfished species.

Finally, as harvesters transition from status quo conditions to a system of IFQs or harvest cooperatives, there is likely to be an adjustment period. Research has indicated that during the initial period of a new market system, participants have difficulty understanding and setting appropriate prices. This can have different effects on individuals as some pay prices that are too high or sell at prices that are too low. In subsequent periods those that sold at inappropriate prices may try to compensate, negatively affecting the ability of the market to reach equilibrium {Anderson, 2005}

How does initial allocation affect groundfish trawl harvesters?

The initial allocation of IFQ and catch history (a term used to describe harvest privileges in a cooperative system) will affect individuals differently. Under some situations it may have an effect on overall performance. The distribution of harvest privileges may change the fishing opportunities of several vessels when compared to status quo and some vessels may find themselves better off while others may find themselves worse off. This distributional effect may be seen as being more or less “equitable” by some stakeholders.

One factor that can be influenced by initial allocation is the ability of harvesters to form voluntary associations to manage risk. Some interested parties have used the term “risk pools” to describe these arrangements. If the initial allocation of groundfish – particularly constraining stocks – is done in a manner where relatively small numbers of entities receive a relatively large amount of constraining species quota, harvesters may have difficulty forming and maintaining voluntary risk pools because those with relatively large amounts of constraining species quota will have an advantage in negotiation.

How will accumulation limits affect groundfish trawl harvesters?

Accumulation limits affect how IFQ will be distributed and also affects the economic performance of individual catcher vessels and the trawl fleet as a whole. The presence of an accumulation limit would tend to increase the number of vessels in the fishery and spread the amount of fishing activity across a wider number of entities. This in turn would tend to lower economic efficiency for the average vessel compared to a case where there is no accumulation limit because it would restrict consolidation. Higher degrees of consolidation would tend to restructure the fleet toward the most economically efficient vessels and increase fleet-wide economic efficiency.

How will a grandfather clause affect groundfish trawl harvesters?

The inclusion of the grandfather clause would allow entities to hold quota in excess of an accumulation limit. The presence of a grandfather clause would tend to make it more likely that large producing entities would be able to maintain that relatively large degree of production, whereas the absence of a grandfather clause may eliminate, or make it more difficult, for certain entities to maintain historic levels of production and participation. A grandfather clause may also influence the negotiations that occur between harvesters and processors over exvessel prices. In the scenarios that include a grandfather clause, large producers that receive quota share in excess of accumulation limits would be in a stronger position during such negotiations in comparison to scenarios without this feature.

A grandfather clause also affects the ability for harvesters to form “risk pools,” or voluntary arrangements to manage constraining species. Voluntary sharing arrangements rely on there being a relative balance in negotiation power. A grandfather clause would tend to allow some entities to receive substantially greater amounts of quota than other entities. This relative imbalance – particularly in the case of constraining stocks – limits the ability for harvesters to form stable and long term risk pools since some entities will have more bargaining power than others as a result of a grandfather clause on constraining species. Not having a grandfather clause for constraining species would make it easier to form risk pools.

How do processor allocations/ties affect groundfish trawl harvesters?

An initial allocation of IFQ to processors and/or processor linkages in a co-op program will tend to influence the negotiating power harvesters have over exvessel prices. An initial allocation of IFQ to processors may impact the harvest quantities available to various vessels, while a processor linkage will arguably not influence the harvest quantities available to vessels. If no IFQ is allocated to processors, it is expected that harvesters will have more negotiating power over exvessel prices compared to status quo. This is because it is expected that they can hold out longer in negotiations with processors without losing fishing opportunity. If IFQ is allocated to processors, it is expected that harvesters will not have the same degree of negotiation power because processors will be able to fish their own IFQ while negotiating with harvesters. In addition, if IFQ is allocated to processors, the amount of quota available to harvesters is likely to be different from a case where the quota is allocated to permits. If IFQ is allocated to processors, those processors may elect to have vessels that otherwise do not hold IFQ fish to their quota.

Scenarios with a processor linkage in a co-op program are expected to affect harvesters somewhat differently than scenarios where IFQ is allocated to processors. A harvester-processor linkage creates a condition where exvessel price negotiations are based more on personal relationships than market conditions. Therefore, the effect on exvessel prices cannot be predicted. However, establishing a processor linkage does not change the distribution of harvest opportunities for vessels like an initial allocation of IFQ to processors might do. This is because catch opportunity is tied to a single vessel and processors do not have control over the quantity of fish available to harvesters.

How will the species covered through the program affect groundfish trawl harvesters?

Both the number and kind of species covered in an IFQ or co-op program will affect harvesters. If a larger number of species are covered by IFQs or co-op allocations, individual vessels will tend to face more constraints on their harvesting opportunities. Alternatively, if fewer species are covered in the program, harvesters are less constrained and have more flexibility in prosecuting fishing activity, but in the extreme case, enough species without coverage may tend to erode the effects of rationalization. In addition to the number of species, the type of species can have a large impact on harvesters. If the species covered in the program have a relatively large trawl allocation and a large amount of quota pounds available on the market, trawl harvesters may find it relatively easy and cost effective to use the marketplace to transfer quota and balance catch accounts. The smaller the trawl allocation the more problematic it will be, at some level, for harvesters because the purchase of quota may prove costly. Below that level, the markets may begin to lack “thickness,” or the presence of enough transactions that a clear price signal will develop. Under this situation, empirical evidence has shown that prices become highly variable and that individuals begin to engage in strategic games. This reduces the efficiency and effectiveness of the market. In addition, if one must cover a catch deficit by purchasing quota for species with extremely low trawl allocations, that quota may be unavailable, meaning the harvester would not be able to cover their deficit.

Finally, for some species it is necessary to consider the potential magnitude of a disaster tow relative to the trawl sector allocation. If the potential magnitude of a disaster tow is large enough relative to the trawl sector allocation (and the conditions described above exist which make it difficult to purchase quota) then it would be reasonable to expect a gradual creeping of harvest activity toward earlier months of the year and harvest activity that begins to appear like an Olympic fishery. This would occur if a disaster tow occurs that causes the trawl sector to reach or exceed its allocation and NMFS closes all or portions of the fishery upon attainment of that allocation. This event would essentially mean that harvesters risk being preempted by other harvesters. The potential of this occurring provides an incentive for harvesters to hedge against the possibility of their fishing opportunity being preempted by someone else by fishing earlier in the year. Over time if this behavior is evidenced in enough harvesters, the fishery may begin taking on the appearance of an Olympic fishery.

How do the number of trawl sectors influence harvesters?

Since either three or four trawl sectors (two for at-sea whiting and either a single shoreside sector or two shoreside sectors) are being considered for the allocation of harvest privileges, this section compares the effects of having a single shoreside sector or two separate sectors for shoreside whiting and non-whiting. It has been hypothesized that if one sector of the fishery has more financial capability of purchasing quota than another sector, then establishing a single shoreside sector may tend to result in a flow of quota from one group of harvesters to another. If overfished species IFQ flows from one sector to another (because one sector has greater purchasing power of), the sector that loses the overfished species IFQ may see their ability to access target species reduced (because of the constraining nature of overfished stocks). Alternatively, if there are four sectors then the separation would tend to preserve the amount of species available to each sector. It is important to note that this argument is theoretical. Available information suggests that both shoreside sectors will see profit improve under a well designed rationalization program. However, having a single shoreside sector will tend to make it easier for trades to occur, while having two shoreside sectors will tend to maintain two fairly distinct sectors.

The number of trawl sectors established will likely influence the flexibility that harvesters have in either sector. By creating three trawl sectors and bundling both shoreside sectors into a common allocation, the trading of quota can occur between both sectors in a manner that creates flexibility in harvesting activity because of the ability to acquire and sell quota as needed. The establishment of four trawl sectors imposes risks to harvesters because it reduces the amount of quota pounds available to each sector and creates a firm set of allocations that could cause a sector to close if one or more of those allocations was met. For example, if the incidental catch of Pacific whiting in the non-whiting sector is higher than anticipated, non-whiting harvesters could end up being constrained by Pacific whiting and would not be able to purchase whiting quota from shoreside whiting harvesters to alleviate some of that constraint. This division of quota between the shoreside sectors could restrict the ability of non-whiting harvesters to prosecute fishing activity if some species become unexpectedly constraining because it establishes boundaries and restrictions on fishing activity without a mechanism for harvesters to work around those restrictions. Alternatively, the establishment of four trawl sectors implies that a set-aside or allocation of non target species will be necessary for the whiting fishery. Such a set aside may be a target species for the non-whiting fishery. Setting firm allocations may mean a loss of economic opportunity in years where the whiting fishery does not need that entire set aside, thus jeopardizing the ability of the trawl sectors to achieve their allocation. Sablefish is one example of a species where catch in the whiting fishery has varied from year to year and which allocations necessary to establish four sectors may result in lost potential or a constraining species. In years where the catch of sablefish is low in the whiting fishery, that catch will reflect a lost economic opportunity to non-whiting harvesters if that quota cannot be transferred to them. The following figure shows sablefish catch in the whiting fishery over the past several years. This figure shows that the catch of sablefish has varied substantially. Interestingly, the largest source of variation is in the shoreside whiting fishery. In years where sablefish bycatch is low, the inability to transfer that catch to the non-whiting sector (because of the establishment of four trawl sectors) represents a lost opportunity.

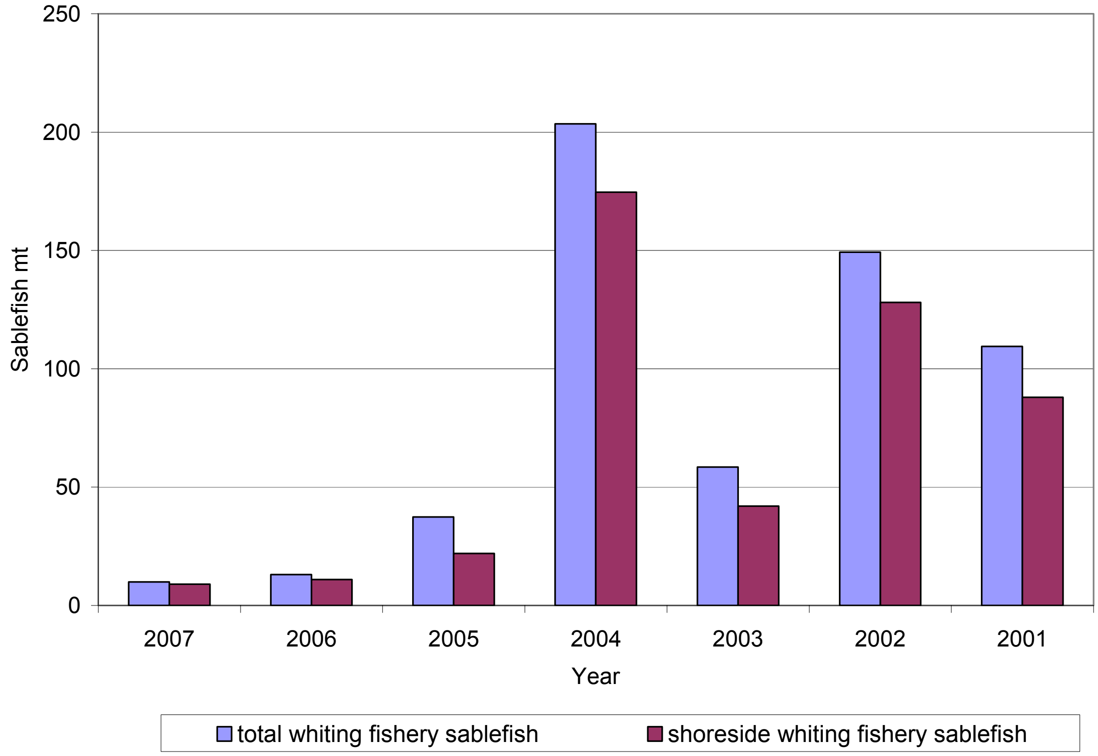


Figure 4–14. Bycatch of sablefish in the Pacific whiting fishery (2001 - 2007).

How will an adaptive management provision affect harvesters?

An adaptive management provision will have a distributional effect on harvesters. If the Council chooses to implement an adaptive management provision that uses 10 percent of the available quota for various objectives, then some vessels may receive portions of this quota while others may not. Compared to status quo it is difficult to predict whether harvesters will gain or lose, but compared to a rationalization program without an adaptive management provision, some vessels may gain and others may lose because of the distributional effect of the provision. There is some possibility that an adaptive management provision will have an effect on exvessel prices since an adaptive management provision will work against a market-driven outcome, potentially leading to a downward effect on overall profitability.

How will a carry-over provision affect harvesters?

A carry-over provision will tend to influence the time horizon for managing one's IFQ. Harvesters are required to stop fishing for the remainder of the year if they are in a deficit (catch exceeds the quota pounds they possess); a carry-over allowance reduces the risk of going into a deficit because it allows harvesters to avoid penalties associated with a deficit condition.

How will tracking and monitoring affect harvesters?

The type of tracking and monitoring program will primarily influence cost from a harvester's perspective. This is because harvesters may be required to pay for some of the cost of carrying an observer. Monitoring may also affect the quota trading system as a whole if the quality of catch data collected is inadequate or imposes different standards on different harvesters. Catch data of insufficient quality may create conditions where it is possible for harvesters to "cheat" and discard catch for example, while catch monitoring not applied in a uniform fashion across harvesters may put some at a relative advantage/disadvantage thus affecting the ability of those harvesters to trade between one another.

4.7.3.2 *Scenario 1 (No Action)*

- Vessel profits
- Fishing vessel safety
- Economic efficiency
- Crew conditions

4.7.3.3 *Scenario 2*

The Effect of scenario 2 on vessel profits and fleet efficiency

Scenario 2 is expected to result in larger vessel profits than other scenarios because of a decrease or elimination of regulatory discard, because of an increase in the catch of target species (in the non-whiting fishery), increased flexibility in harvest timing, and the cost efficiencies created by fleet consolidation. Such changes are expected to be experienced in both the non-whiting fishery and the whiting fishery, though the magnitude is likely to differ between the two fisheries with the non-whiting fishery experiencing more cost efficiency gains than the whiting fishery. These expectations are tempered, however, by the risks posed to harvesters because of the low trawl allocations expected to be made for some species, and the number of those species that are managed with individual quota under this scenario. In this respect, scenario 2 results in the highest degree of risk across the largest number of harvesting entities of all scenarios.

<u>Non-whiting trawl fishery</u>

Figure 4–4 shows that exvessel revenue in the non-whiting fishery may increase to \$32–\$40 million compared to status quo exvessel revenues of \$22–\$23 million. Regulatory discards are decreased or eliminated in this scenario because the IFQ is defined as a total catch tool.[23] Vessels fishing under a total catch program will tend to retain more of their catch because catch is debited from their quota account regardless of whether they retain that catch or not. If catch is discarded under a total catch program, that discard has a cost because it is a lost opportunity. This reduction in discard is expected to increase exvessel revenues to the fleet by \$2–\$3 million annually. Target species catch is increased in the non-whiting fishery under this scenario because there is a reward associated with avoiding overfished stocks that comes in the form of increased harvests of currently under-utilized target species. The reader is referred to the description of the bycatch reduction analysis in Appendix C for more detail on these effects.

[23] Pacific halibut is covered by Individual Bycatch Quota in this scenario. However trawl gear is not a legal gear for Pacific halibut, and therefore, regulations will likely still require discard of this species if caught with trawl gear.

Fleet consolidation in the non-whiting sector is expected to be substantial under scenario 2. Analysis indicates that the fleet may be expected to consolidate between 40 and 60 vessels in the non-whiting fishery. Accumulation limits under this scenario do not appear to restrict such consolidation, and therefore, the full effect of potential cost efficiency should be realized under this scenario.[24] When combined with potential increase in exvessel revenues, profits under this scenario may be on the order of $12–$20 million (or average vessel-level profits of $300,000–$330,000 annually), compared to status quo fleetwide revenues of $0–$2 million in losses annually. The reader is referred to Appendix C for more detail on fleet consolidation.

The exvessel price received by non-whiting trawl harvesters is likely to be higher in this scenario compared to all other scenarios, and higher prices will mean that the actual levels of exvessel revenue will be higher than the predicted levels shown above. The reason for these higher prices is because the initial allocation of IFQ is made exclusively to LE trawl permits, and this enhances harvester's negotiation power relative to status quo. This enhanced negotiation power is likely to exist in the short term and possibly over the long term. While theory would suggest that quota could be purchased by processors over the long term (thus increasing processor's negotiation power and resulting in some decrease in exvessel price) the accumulation limits included in this scenario will limit the ability of processors to purchase substantial quantities of quota. Accumulation limits tend to work in the harvesters favor over the long term because scale economies tend to lead to the creation of fewer processors than there are harvesters. The accumulation limits in this case would lead to a maximum of 3 percent being controlled by any single entity, and this is substantially less than the amount of groundfish currently handled by several processors of trawl groundfish on the west coast. This means that the accumulation limits act as a de-facto limit on the amount of quota that could be purchased by processors of trawl groundfish and insure that quota shares remain – to a large degree – in the hands of harvesters.

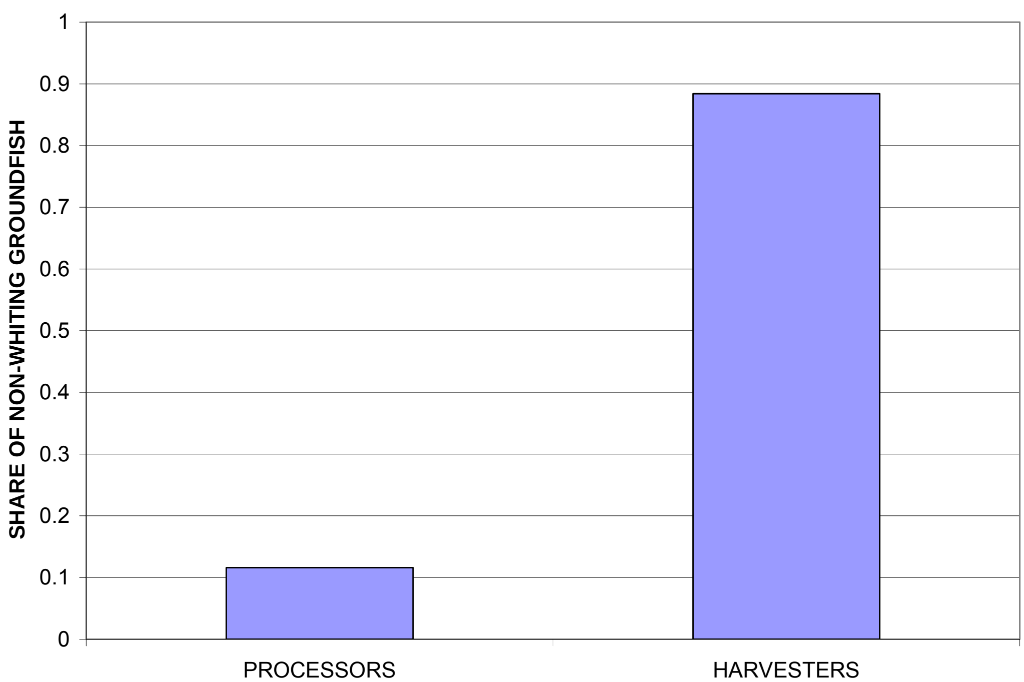


Figure 4–15. Share of non-whiting groundfish allocated to harvesters and processors in scenario 2.

[24] This statement assumes the vessel length endorsement is eliminated.

Pacific whiting trawl fishery

Exvessel revenues are not expected to change substantially in the whiting sectors relative to status quo, but profits are expected to improve. Benefits from rationalization may be realized by whiting catcher vessels because of increased operational flexibility, enhanced ability for business planning, and fleet consolidation. Operational flexibility allows entities to minimize costs, maximize gross revenue potential, or take advantage of favorable market conditions, thereby increasing profits. Increases in product quality and product recovery may occur to some degree in the whiting sector, and these improvements may trickle down to harvesters in the form of higher exvessel prices. A quantitative prediction of changes in exvessel prices as a result of these effects cannot be made. However, qualitative information suggests that these effects should be minor in the mothership sector. This is because processing capital is being used in the at-sea fishery, which is already more efficient as a result of the American Fisheries Act. These improvements led to processing capital with higher recovery rates than prior to enactment of the AFA, and that same capital is being used off the west coast to process Pacific whiting. Therefore, changes in product recovery should be minor. Changes in product quality and recovery that occur should come about as a result of an increase in operational flexibility, which allows harvesters to change strategies to capitalize on more favorable conditions.

Fleet consolidation in the mothership segment of the whiting sector should be minor relative to the non-whiting sector. Since harvesting opportunities in the mothership sector are bounded by opportunities in the shoreside whiting sector (some mothership vessels also participate in the shoreside fishery) and on opportunities in the Alaska pollock fishery, the degree to which harvest timing can change is limited, and this restricts consolidation to some degree. It is expected that the mothership sector will continue to operate prior to the start of the shoreside sector. An increase in fishing effort may also occur during the fall months to take advantage of more favorable market conditions. However, a substantial change in the harvest timing is not very likely because of the timing of the shoreside whiting fishery, the Alaska pollock fishery, and the availability of the Pacific whiting resource. Without a substantial increase in season length, it is unlikely that there will be substantial fleet consolidation because doing so would mean foregoing harvest quantities.

In the shoreside portion of the whiting fishery, it may be reasonable to assume fleet consolidation that is greater than the mothership sector, but not as great as the non-whiting portion of the fishery. More consolidation is expected because the number of vessels in the fishery has increased over the past several years without much change in the Pacific whiting OY. Therefore, it is reasonable to expect that fewer vessels could participate in the fishery while still taking the harvestable surplus, however, how much consolidation will actually occur is limited by fishing season length and seasonal distribution of the stock. While the Pacific whiting stock migrates north throughout the course of a year, it is unlikely that shoreside whiting processors will establish themselves further north than the southern Washington coast to take advantage of this northern migration. This is because several coastal Washington ports (such as Neah Bay) have limited access to fresh water (which is necessary for processing). Infrastructure is also limited in many of these ports and may not be sufficient to support a processor large enough to handle Pacific whiting deliveries. As discussed above, the shoreside whiting sector's season may be limited by the depth-based migration of the stock, which can make the fish inaccessible to these vessels by October (and possibly earlier). Thus, both geographic and depth migration factors may limit the shorebased sector's season.

The length of harvesting activity in the mothership and shorebased whiting sectors is expected to get somewhat longer as those sectors switch to a rationalized fishery. This is due to the elimination of competition for the resource, because of increased flexibility in harvest timing, and because of changes in quality attributes (such as fish size and flesh color) that improve the value of Pacific whiting later in the year. This change in the pace of harvesting will tend to increase product quality, and this should tend to increase the price that vessels receive for their catch.

The negotiation power that Pacific whiting harvesters have over exvessel prices is higher in this scenario relative to the other scenarios, including status quo. Under scenario 2, holders of LE trawl permits receive the entire initial allocation of quota and this is expected to increase the negotiation power of harvesters. Over the long term, however, processors may be able to acquire enough Pacific whiting quota to influence exvessel prices. The control limits specified in this scenario for Pacific whiting could allow four business entities to control the harvest of shoreside whiting and four business entities to control the harvest of mothership whiting. Since currently there are more than four processing entities, this scenario could allow processors to have control over all of the whiting IFQ over the long term, and therefore exvessel prices may only be higher in the short term.

Under the initial allocation scheme included in this scenario, some processing entities will receive an initial allocation of quota because they own limited entry trawl permits. This is shown in the following figure.

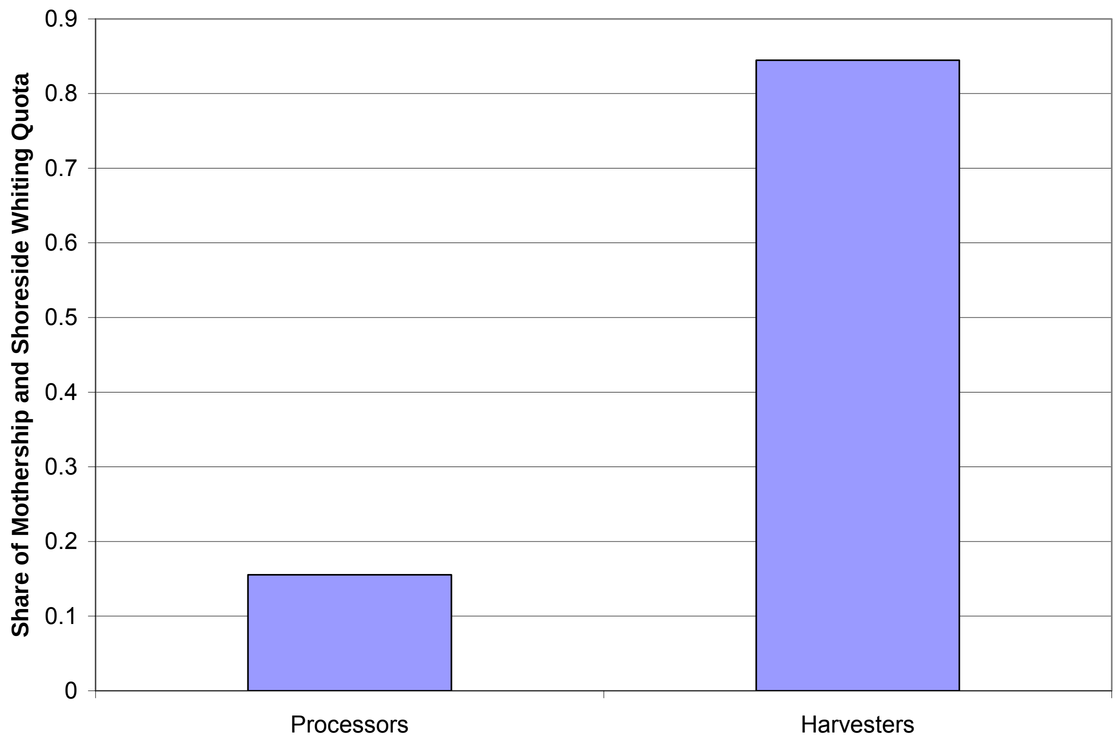


Figure 4–16. Share of mothership and shoreside Pacific whiting allocated to harvesters and processors in scenario 2.

Additional Factors Influencing the Profits of Non-Whiting and Whiting Harvesters

Another way this scenario affects profitability, which was not addressed previously, is the costs that harvesters must bear in administering the tracking and transfers of quota shares and quota pounds. This cost is a result of the number of species covered in the program and the complexity that is created by the trading and tracking of several species of groundfish. This scenario has the largest number of vessel-species combinations in the quota trading and catch tracking aspect of the programs being considered.

This number of vessel-species combinations is likely to translate into a high relative cost that harvesters bear in conducting such activities.

The establishment of three trawl sectors for the purpose of trading quota may have an effect on costs as well. Establishing a larger, common pool of quota available to both the shoreside whiting and non-whiting sectors may make it easier for vessels in each sector to find quota on the market to trade.

Table 4-8. Summary of the effect of scenario 2 on profits and fleet efficiency.

Non-whiting Catcher-Vessels	Large and positive. Fleetwide profit expected to increase by \$12-\$22 million as a result of increased catch and fleet consolidation. Exvessel prices should increase profit higher than indicated numbers as a result of negotiation power and because of gear switching. Accumulation limits do not appear to restrict consolidation.
Shoreside Whiting Catcher Vessels	Minor and positive. Some fleet consolidation expected. Minor changes in exvessel revenue may be expected as a result of improved product quality. Exvessel prices expected to increase in the short run as a result of increased negotiation power.
Mothership Catcher Vessels	Minor and positive. Some fleet consolidation expected. Minor changes in exvessel revenue may be expected as a result of increased product quality. Exvessel prices may increase as a result of increased negotiation power.

<u>The distribution of profits under scenario 2</u>

The distribution of profits under this scenario is influenced by the initial allocation of quota shares, and also by the species that are covered with IFQ in the program. The species covered in the program will tend to influence the distribution of revenues and may result in a negative impact on some harvesters while positively impacting others. Harvesters that operate in areas where constraining groundfish species are more commonly caught will tend to find it more difficult to access target species relative to harvesters in other areas. This is because the individual accountability of catch will restrict opportunity if a vessel reaches or exceeds the quota held of a constraining species. Vessels operating in areas where there are relatively more constraining species may run out of constraining species quota before accessing all of their target species. This constraint may make it more difficult for some vessels to access target species relative to status quo. Since this scenario does not have elements that would mitigate against these regional effects, they are likely to be the most pronounced under this scenario (and scenario 3.b) compared to others.

Initial allocation under this scenario has a relatively uneven distribution relative to scenarios 4 and 5. This means that there is a large difference in the distribution of wealth created by the initial distribution of shares. This initial distribution may influence short-term harvest opportunities and will tend to favor relatively fewer individuals than the other alternative ways of distributing quota.

The accumulation limits specified under this scenario do not appear to restrict vessel consolidation (as illustrated in previous paragraphs under broad-level effects), but one entity may be restricted by the control limits. The grandfather clause allows that entity to exceed the control limit initially, but it cannot acquire additional quota. Several entities receive quota shares that are approaching zero, some entities receive quota shares that are higher than 3 percent, and the majority of entities receive quota shares that are between 0.5 percent and 2 percent of the non-whiting quota shares. The figure below shows that 116 entities would receive an allocation of non-whiting groundfish under this scenario.

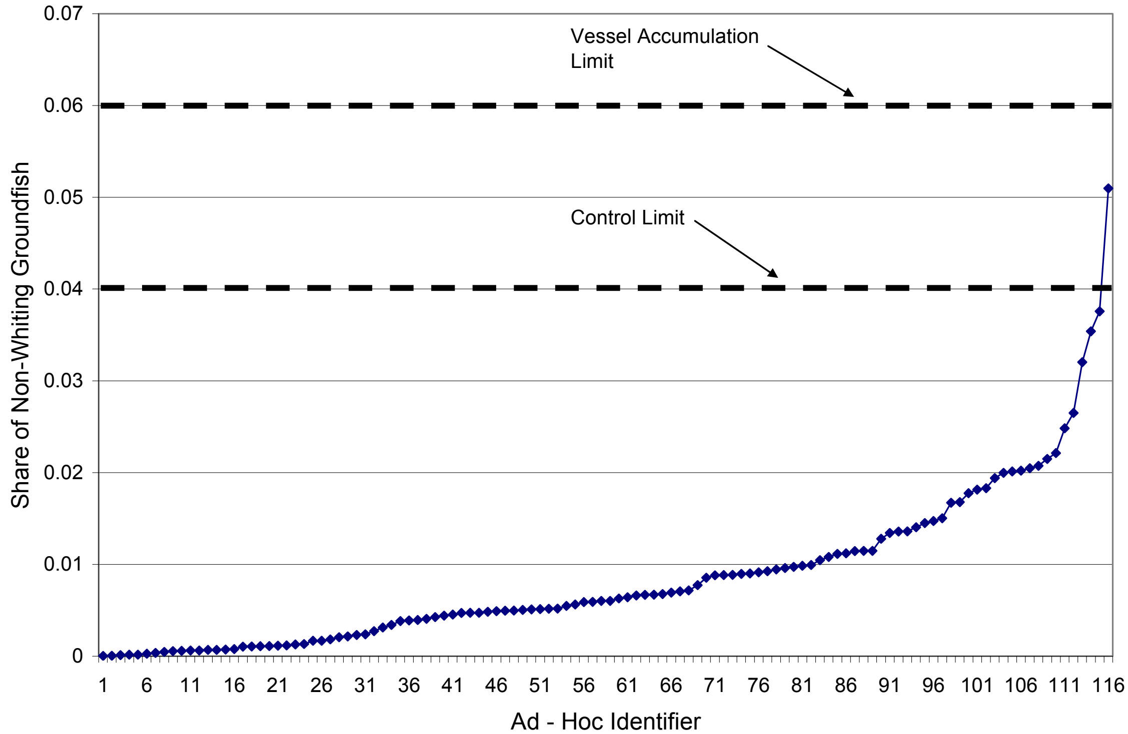
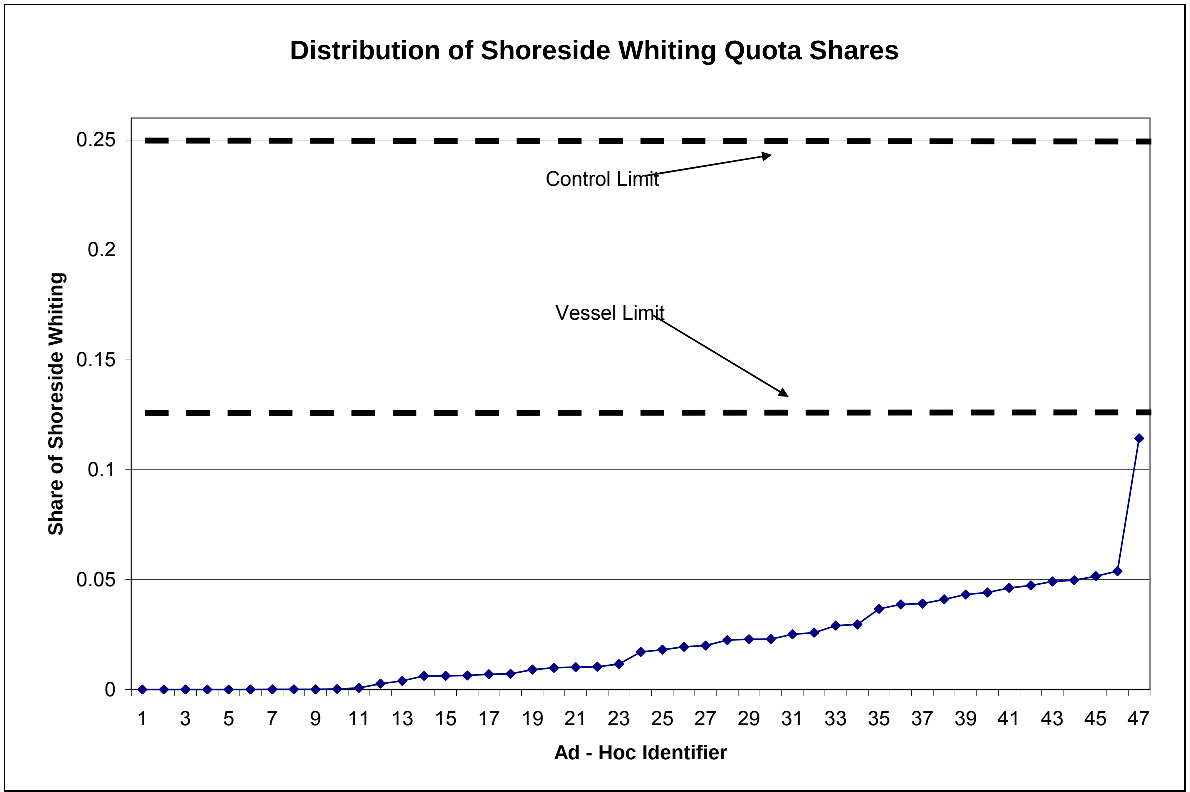
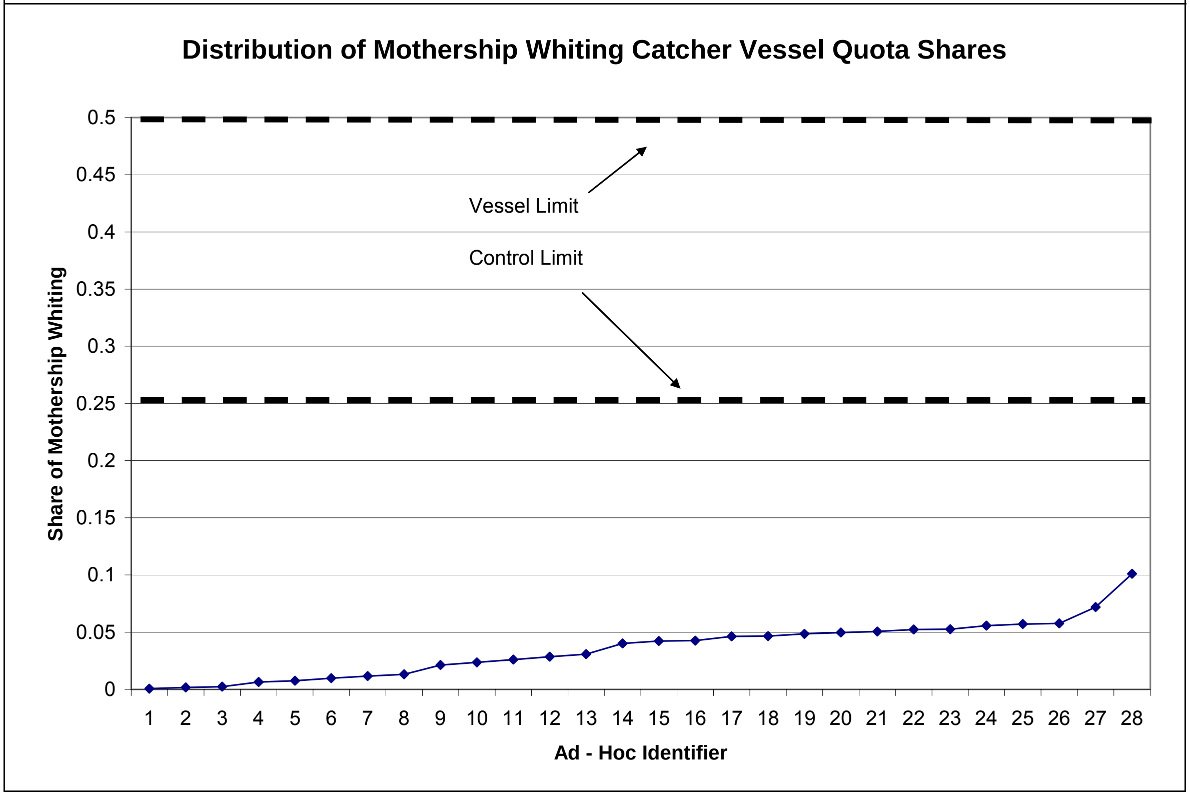


Figure 4–17. Distribution of aggregate non-whiting quota shares and accumulation limits under scenario 2 (entities with no initial allocation are excluded).

In the whiting fishery, accumulation limits also do not appear to be restrictive. In all three sectors of the whiting fishery, business entities do not appear to be restricted by vessel limits or control limits. Nor would these limits likely restrict holdings by those entities that participate in more than one sector of the whiting fishery. The number of entities receiving an initial allocation of whiting under this scenario are listed in the following table. In addition, 53 entities will receive an initial distribution of whiting from one or more sectors of the whiting fishery (including the C-P sector).

Quota type	Total Number of Quota Share Recipients for each sector
Non-Whiting	116
Shoreside Whiting	47
Mothership	28
Total (Non-CP Sectors)	120


Distribution of Shoreside Whiting Quota Shares
Control Limit
Vessel Limit
Share of Shoreside Whiting
0.25
0.2
0.15
0.1
0.05
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Ad - Hoc Identifier


Distribution of Mothership Whiting Catcher Vessel Quota Shares
Vessel Limit
Control Limit
Share of Mothership Whiting
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
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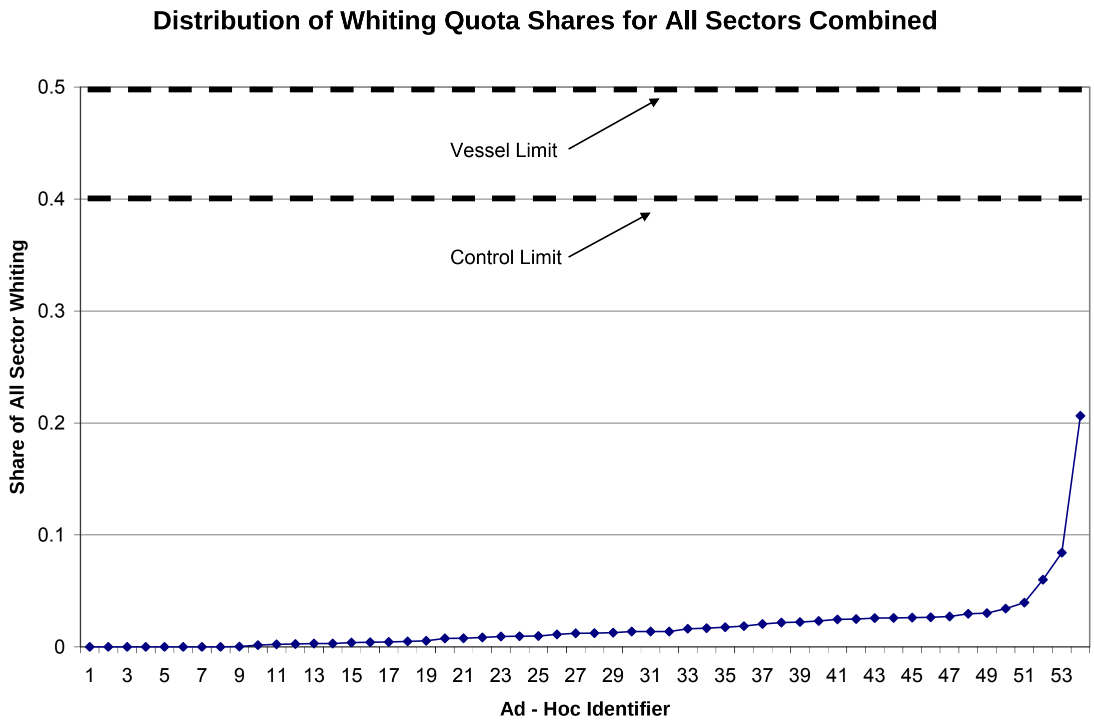


Figure 4–18. Distribution of whiting quota shares and accumulation limits under scenario 2 (entities with no initial allocation are excluded).

Under this allocation scheme, many of the eligible recipients will receive no initial allocation of some types of groundfish. This is likely caused by the fact that the history being used is landings history and it may be reasonable to assume that in many of these instances, vessels did actually catch some of these groundfish, but they were discarded for one reason or another. Since the rationalization program envisioned under this scenario accounts for total catch (landings and discard) those permits that do not receive an initial allocation of some groundfish will almost certainly need to purchase quota shares or quota pounds of these species. This serves as a distributional issue that may be an important consideration since the initial allocation may tend to favor some while disadvantaging others. The information describing this effect is covered in more detail under Appendix A.

Table 4-9. Summary of the effect of scenario 2 on distribution of profits.

Non-Whiting Catcher Vessels	Harvesters not owned by processing companies will receive nearly 90 percent of the initial allocation of non-whiting groundfish. Harvesters in high bycatch areas or areas with unfavorable market conditions may be at a relative disadvantage. The high/low relative distribution of non-whiting quota shares is large. Some harvesters will not receive allocations of some groundfish species.
Shoreside Whiting Catcher Vessels	Harvesters not owned by processing companies will receive approximately 85 percent of mothership and shoreside whiting quota. The high/low relative distribution of whiting quota shares is small relative to the distribution of non-whiting quota shares.

Mothership Catcher Vessels	Harvesters not owned by processing companies will receive approximately 85 percent of mothership and shoreside whiting. The high/low relative distribution of whiting quota shares is small relative to the distribution of non-whiting quota shares.

The risk to profits posed by scenario 2

Scenario 2 imposes risks to individual harvesters across the largest number of entities of all scenarios, including status quo. Risks associated with this scenario create a potential for harvesters to generate less profit than expected under a rationalized fishery. In the worst case scenario these individual risks may result in less aggregate revenue in the fishery than expected. This increase in risk relative to status quo is due to the presence of thin market conditions for several species, including overfished stocks and various nearshore groundfish species, and individual accountability for species with low trawl allocations.

Since this scenario results in a more extreme high/low relative distribution of quota shares (since it is based on catch history), and has a grandfather clause (particularly for constraining stocks) the ability of harvesters to form voluntary pools to manage risk may be the most difficult under this scenario compared to the other scenarios because these factors tend to favor some harvesters more than others.

Table 4-10. Summary of the effect of scenario 2 on risk to profits.

Non-Whiting Catcher Vessels	High level of risk created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of quota shares favors some relatively more than others making the formation of risk pools difficult.
Shoreside Whiting Catcher Vessels	High level of risk created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of quota shares favors some relatively more than others making the formation of risk pools difficult.
Mothership Catcher Vessels	High level of risk created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of quota shares favors some relatively more than others making the formation of risk pools difficult.

Fishing vessel safety

Fishing vessel safety is typically enhanced by the elimination of Olympic-style fisheries, by increased flexibility in timing fishing operations, and by improvements in revenues being generated by fishing activity. It is envisioned that the rationalization programs being considered will tend to increase operational flexibility and in this way improve safety conditions. Under scenario 2, profits are generally expected to increase for both non-whiting and whiting sector catcher-vessels and it may be reasonable to expect that this increase would lead to better maintenance of fishing vessels. The elimination of Olympic fishing activity in the mothership and shoreside sectors of the whiting fishery is also expected to enhance fishing vessel safety because vessels will no longer feel the need to compete against one another to maximize catch, which can cause them to fish in hazardous conditions. In the non-whiting fishery, an Olympic-style fishery does not currently exist. Safety concerns in this fishery are largely driven by a lack of profitability under status quo conditions. As illustrated previously, it is estimated that vessels participating in this fishery generate profits somewhere between $0 and a loss of $2 million annually. This creates conditions where vessel maintenance may be less than adequate, and such lack of maintenance may lead to conditions that are relatively less safe than under conditions where vessels are better maintained. Therefore, it is reasonable to expect rationalization to improve safety conditions in the non-whiting sector because of increased profitability, and to improve safety in the shoreside and mothership whiting sectors because of increased profitability, enhanced operational flexibility, and an elimination of Olympic fisheries.

Table 4-11. Summary of the effect of scenario 2 on safety.

Non-Whiting Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions as the fleet no longer feels the need to compete and to fish in hazardous conditions.
Mothership Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions as the fleet no longer feels the need to compete and to fish in hazardous conditions.

4.7.3.4 *Scenario 3*

The effect of scenario 3 on vessel profits is similar in many respects to that of scenario 2: harvesters are likely to access more target species in the non-whiting sector; consolidation and associated cost savings are expected in the harvesting side; operational flexibility and ability to conduct business planning is enhanced; and risks exist to individual harvesters because of low trawl allocation species and the presence of thin markets. However, scenarios 2 and 3 differ in two ways in terms of the overall magnitude and/or distribution of profits. The overall magnitude of vessel profits gained under this scenario is potentially affected by an initial distribution of quota shares to processors (scenario 3.b) and the fact that such a distribution to processors may influence exvessel prices. Vessel profits are potentially affected by scenario 3.a because of the presence of an adaptive management provision. In this scenario, the analysis assumes that an adaptive management provision is used to mitigate against adverse impacts that occur on processors.[25] Such a program is likely to work in contrast to the effect of the market. Since markets tend to work toward efficient and profitable outcomes, a program that counters a market effect may restrict some of the gains in profitability expected from rationalization.

Expected Effects of Adaptive Management for	Expected Effects of an Initial Allocation to

[25] It is important to note that the existing suite of alternatives allows the adaptive management provision to be used for more than just adversely impacted processors. If an adaptive management program is adopted as currently specified, the adaptive management program could be used for many different objectives such as incentives for bycatch reduction, the use of habitat-friendly gear, for adversely impacted communities, or for adversely impacted processors.

Processors	Processors
Geographic effects on vessels in various ports.	Geographic effects on vessels in various ports.
Exvessel price effect that is smaller than the exvessel price effect attributed to an initial allocation to processors.	Exvessel price effect that is larger than the exvessel price effect attributed to adaptive management shares.

The distribution of vessel profits is also affected by the conditions that exist in scenario 3.a and 3.b. A distribution of quota shares to processors will tend to have a geographic effect as those processors direct landings associated with their quota shares to particular ports where their plants are located. An adaptive management provision will tend to have geographic consequences as well if adversely impacted processors are located in distinct areas and adaptive management shares are directed to processors in those distinct areas. Given that the only differences between scenario 3 and 2 is in the consideration of processor allocations of quota shares and an adaptive management provision to mitigate against adverse impacts to processors, this section concentrates on the effect of those two provisions on harvesters.

The Effect of scenario 3 on vessel profits and fleet efficiency

The distribution of quota shares to processors will tend to have a downward effect on exvessel prices compared to a case where no initial distribution of quota shares is made to processors. It is unclear whether an allocation to processors will decrease prices relative to status quo, though it likely depends on the amount of quota allocated to processors. An initial allocation of quota to processors will also have a geographic effect on harvesters. This is because quota shares allocated to processors will tend to be landed in ports where those processors are located. Vessels in those ports may have access to more quota shares than if an initial allocation was made to permits. Inversely, harvesters in ports without processors may end up with less access to quota than if an initial allocation was made to permits. In other words, vessels fishing in ports where processors are located may be impacted differently than vessels in ports without processors because of their access to processor-held fishing quota.

Over the long run processors may continue purchasing quota shares in the whiting sectors because of the relatively large size of the control limit. The 25 percent control limit specified for the shoreside and mothership whiting sectors means that 4 entities could theoretically control the harvest of whiting in both sectors. It is unlikely that processors will acquire much additional quota in the non-whiting sector because of the control limits. The 3 percent control limits specified for the non-whiting sector make it difficult for the processing sector as a whole to acquire additional quota, unless, over time, that sector becomes composed of multiple small producers. This means that over time, exvessel prices in the shoreside and mothership whiting sectors may fall to some degree since processors have the ability to acquire additional quota, but it is not likely that exvessel prices will fall over time in the non-whiting sector because processors have limited ability to purchase additional quota.

Effect on Profits from an Initial Allocation of Quota to Processors
• Downward effect on exvessel prices compared to a case with no initial allocation to processors. • Exvessel price effect likely to be felt by all harvesters.   o Profits still expected to be greater than status quo. • Large portions of quota share allocated to relatively fewer entities than under scenario 2. • Geographic effect directs harvest to areas where processors are located.

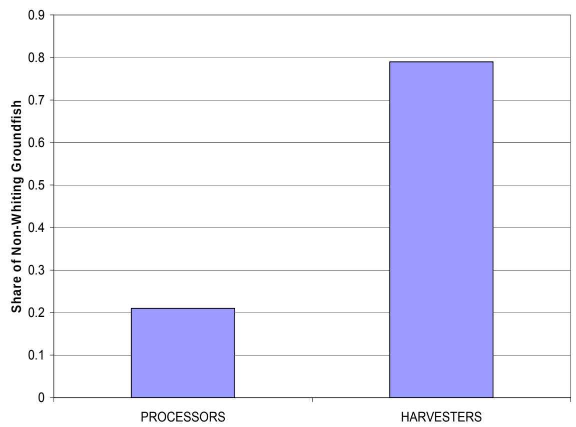


Figure 4–19. Share of non-whiting groundfish allocated to harvesters and processors under scenario 3.a.

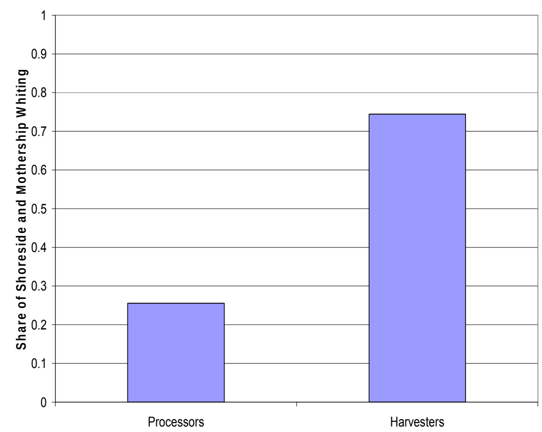


Figure 4–20. Share of shoreside and mothership whiting groundfish allocated to harvesters and processors under scenario 3.a.

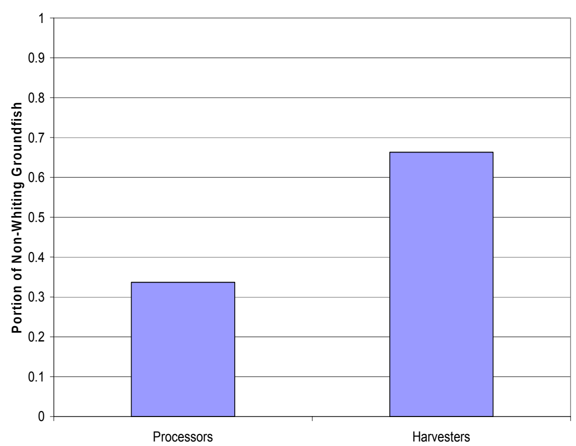


Figure 4–21. Share of non-whiting groundfish whiting allocated to harvesters and processors under scenario 3.b.

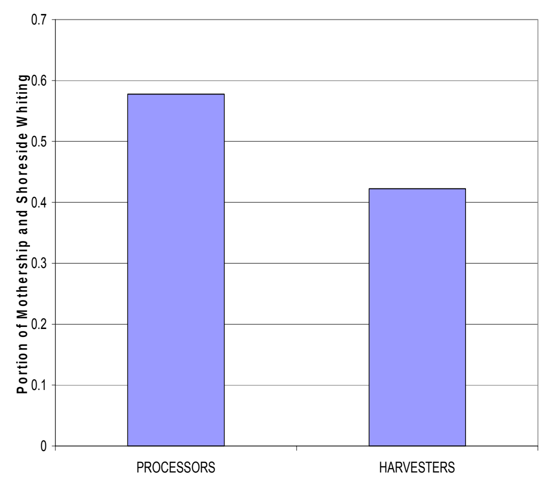


Figure 4–22. Share of shoreside and mothership whiting groundfish allocated to harvesters and processors under scenario 3.b.

Since this alternative does not create a link between harvesters and processors (harvesters with quota are free to deliver to any processor and processors with quota share can lease to any LE trawl permitted vessel), it is possible that harvesters and processors will self-divide themselves into those with quota and those without quota. Since price negotiation tends to favor those holding quota, harvesters holding quota may elect to sell to processors without quota. They would do this because of their relative negotiation power and the fact that selling to processors without quota will enable them to negotiate higher exvessel prices. Conversely, processors with quota may elect to lease their quota to harvesters without quota because they can bid exvessel prices downward against those harvesters. If harvesters and processors with quota shares attempt to work together, both sides would likely come to a compromise on exvessel prices. But if both sides know that they can get a better price by dealing with an entity without quota shares, then a relationship between harvesters with quota shares and processors with quota shares may become unstable.

Like an initial allocation to processors, an adaptive management provision may have an impact on exvessel prices. If used as envisioned, such an adaptive management program will tend to limit the number of potential processors that harvesters can deliver catch to. However, this is only true if harvesters are prosecuting adaptive management groundfish, which comprises 10 percent of the quota shares. If they are not harvesting adaptive management share groundfish, there are no limitations on the number of potential buyers. A limitation in the number of potential buyers may have a downward effect on prices paid for the adaptive management fish because there are fewer places that harvesters have to shop around for the best price.

Table 4-12. Effect on harvesters from an adaptive management provision to mitigate against harm to adversely impacted processors.

- Downward effect on prices for the portion of catch that is "adaptive management fish" compared to the scenario with no initial allocation to processors.
    - Profits still expected to improve relative to status quo.
- The relative initial distribution of quota shares is the same as scenario 2. The 10 percent reallocation can change the initial distribution.
- Will likely have a geographic effect that directs harvest to areas where processors are adversely impacted. This geographic effect is expected to be different than the geographic effect found in scenario 3.b.

A 10 percent adaptive management provision used to help processors is not likely to impact exvessel prices to the same degree as scenario 3.b, simply because the volume of quota attributed to processors is lower. In scenario 3.b, the amount of initial allocation to processors is approximately 33 percent for non-whiting groundfish, and approximately 51 percent for whiting (processors receive more than 25 and 50 percent respectively because some processors own limited entry trawl permits). A 10 percent adaptive management provision intended for use by adversely impacted processors is small in comparison.

While exvessel prices may be impacted by initial distributions of quota shares to processors or because of an adaptive management provision, scenario 3 is not expected to make harvesters worse off than under status quo conditions. Indeed, the expected amount of consolidation and cost efficiency (shown under broad-level effects) will reduce harvesting costs. The magnitude of cost savings expected in the non-whiting sector as a result of consolidation suggests that harvester profits should improve over status quo conditions even if exvessel prices are somewhat lower. Theoretically, profits could be compromised if exvessel prices are reduced, but such a price reduction would need to be substantial to offset the gains in cost efficiency attributed to fleet consolidation.

The distribution of profits under scenario 3

An initial allocation to processors and an adaptive management provision will have differing distributional effects. Both an initial allocation to processors and an adaptive management provision will have geographic implications. If adversely impacted processors are located in distinct areas of the coast, a distribution of shares in a manner that benefits those processors would tend to have corollary geographic impacts that favor some harvesters. Those harvesters located in ports where there are adversely impacted processors may stand to have access to more quota than would otherwise be the case if no adaptive management quota was available. An initial allocation to processors would also have geographic implications because processors are located in distinct areas of the coast.

The distribution of quota shares across entities under scenario 3.b is different than under scenario 2 because of the allocation to processors. In total, there are 121 entities that are expected to receive quota shares of non-whiting groundfish under scenario 3.b, and 3 of these entities exceed the control limit (but still receive the full amount due to the grandfather clause). Under this option, the majority of receiving entities receive less than 1 percent of the non-whiting allocation of groundfish, while a handful of entities receive over 2 percent.

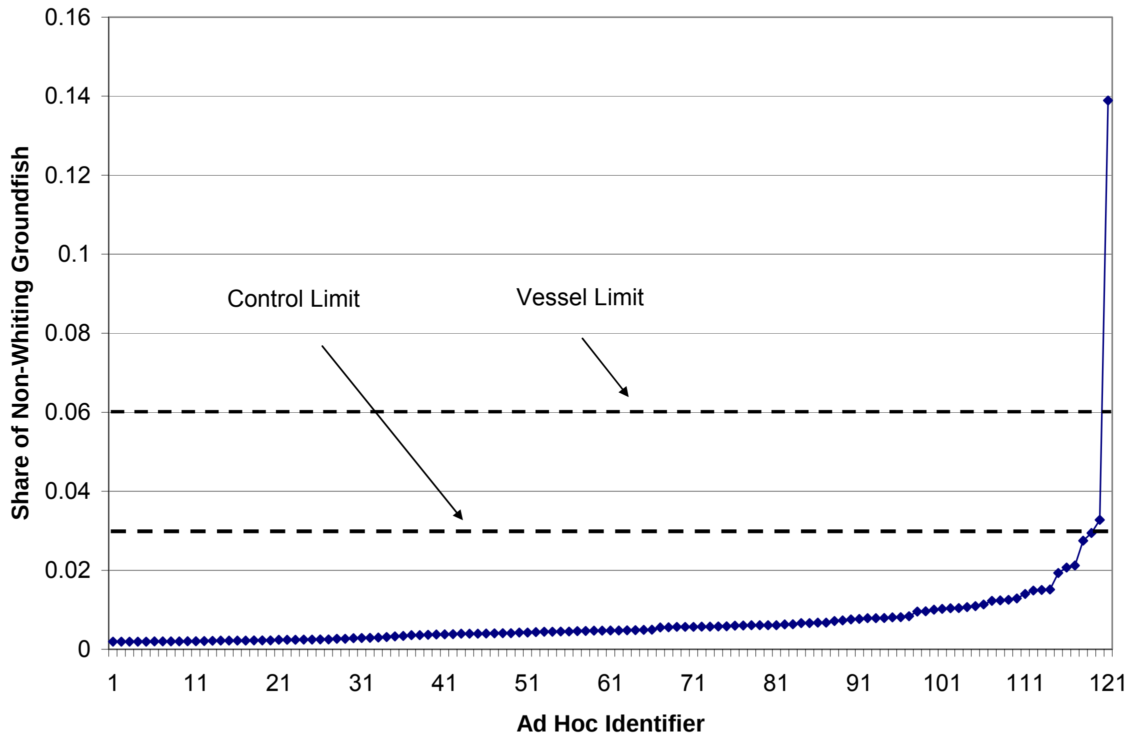


Figure 4–23. Distribution of aggregate non-whiting quota shares and accumulation limits under scenario 3.b.

In the whiting sectors there is also a different distributional effect, though the difference between scenario 2 and 3.b is relatively less for the whiting sectors than the non-whiting sectors. Interestingly, by including shoreside processors in the initial allocation, the initial distribution of shoreside whiting becomes relatively more equal than in scenario 2. As shown in the figure below, the largest recipient of shoreside whiting quota shares receives less than 10 percent of the shoreside whiting quota, while under scenario 2 the largest recipient receives almost 12 percent. The total number of entities that are estimated to receive shoreside whiting quota shares under this scenario is 67.

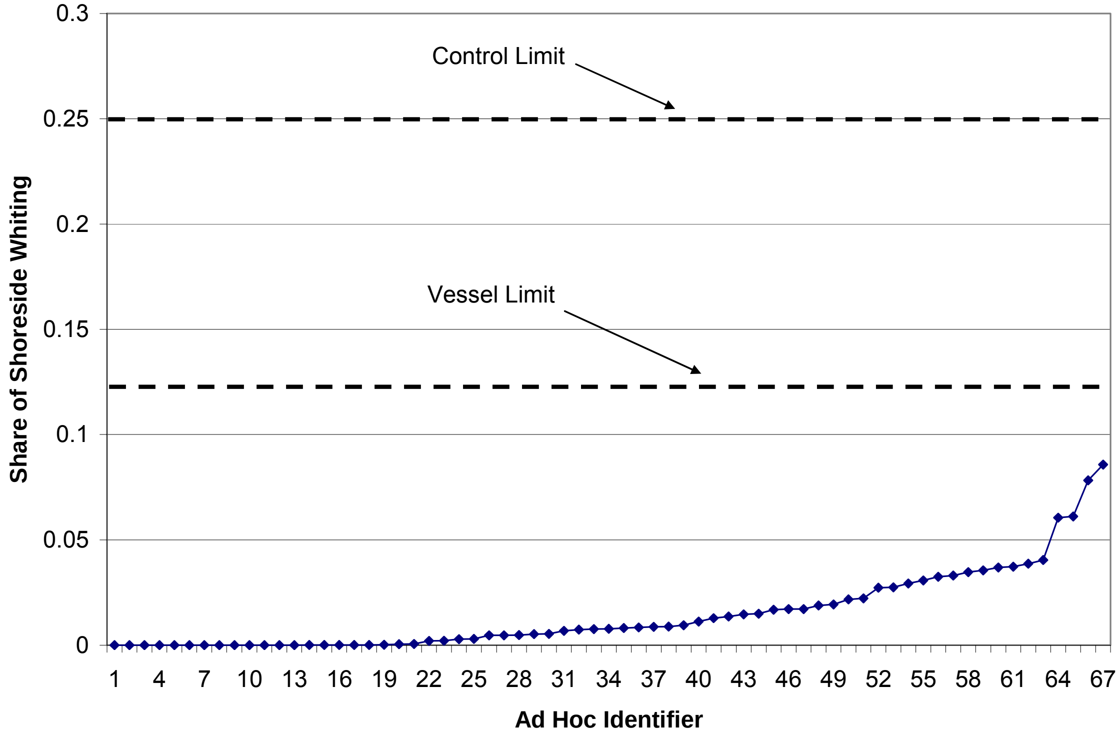


Figure 4–24. Distribution of shoreside whiting quota shares and accumulation limits under scenario 3.b.

In the mothership sector, an initial allocation to processors shifts the distribution of whiting somewhat, but less than in the non-whiting sector. Contrary to the shoreside sector, by making an initial allocation to processors, the largest entity receives approximately 13 percent of the mothership whiting quota compared to scenario 2, where the largest entity receives approximately 10 percent. The total number of entities receiving mothership whiting quota shares is 30 under this scenario.

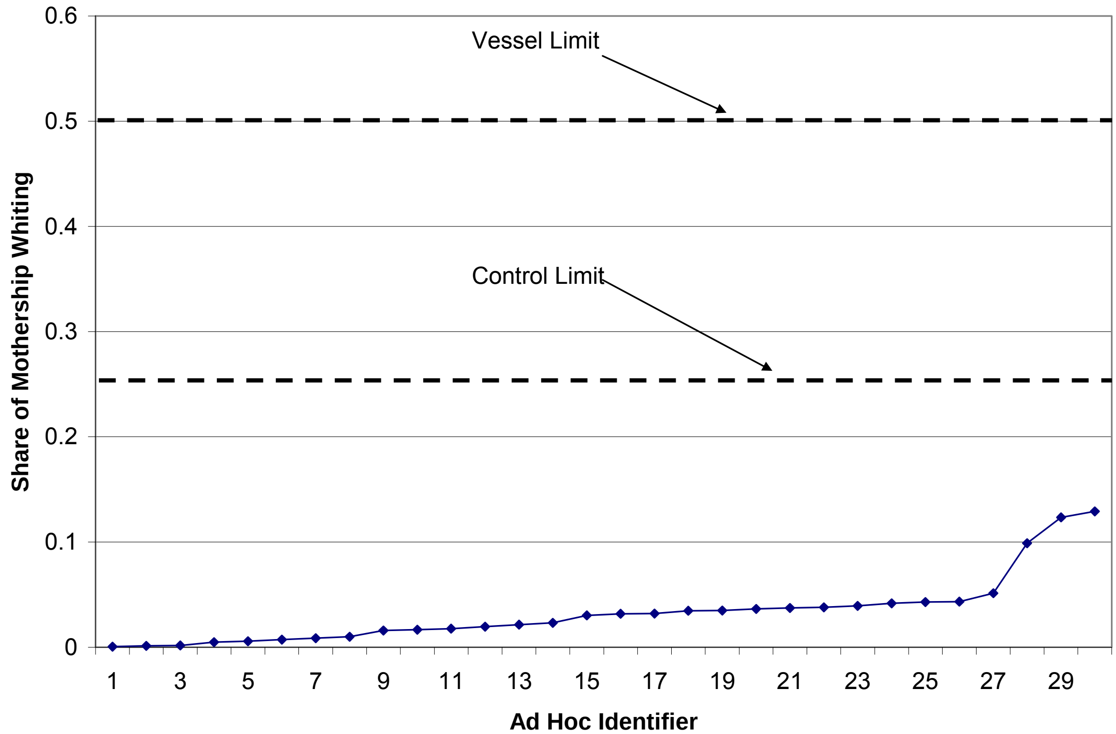


Figure 4–25. Distribution of mothership whiting quota shares and accumulation limits under scenario 3.b.

The number of quota share recipients under scenario 3.a is the same as the number of recipients under scenario 2. Scenario 3.b has a much larger number of quota share recipients. In particular, the number of entities receiving non-whiting quota shares under this scenario is 297 compared to 116 in scenario 2 and 3.a. The number of entities receiving shoreside whiting quota shares is 67 and the number of entities receiving mothership quota shares is 30. The total number of entities receiving quota shares under this scenario is 305.

Sector	Number of Quota Share Recipients under Scenario 3.a	Number of Quota Share Recipients under Scenario 3.b
Non-Whiting	116	297
Shoreside Whiting	47	67
Mothership	28	30
Unique Number of QS Recipients (Non-CP Sectors)	120	305

Fishing vessel safety

Table 4-13. Summary of the effect of scenario 3 on safety.

Non-Whiting Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance.

Shoreside Whiting Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions as the fleet no longer feels the need to compete and to fish in hazardous conditions.
Mothership Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions as the fleet no longer feels the need to compete and to fish in hazardous conditions.

4.7.3.5 *Scenario 4*

The effect of scenario 4 on non-whiting harvesters differs somewhat from scenario 2 and 3. For Pacific whiting harvesters, the effect of scenario 4 differs to a much greater degree. Harvesters in the non-whiting trawl sector face risks because of low allocation and thin market species. Harvesters also face risks because of the lack of a carry-over provision and the establishment of four trawl sectors and the resulting sector-specific allocations. Finer sector-specific allocations can reduce flexibility and impose greater restrictions on harvest activity compared to a case where quota can be traded between sectors. One element of this scenario that increases the potential that non-whiting harvesters will effectively deal with risk is the manner in which IFQ is allocated – particularly for overfished stocks. The distribution of overfished species quota based on a bycatch rate creates a more balanced distribution of negotiating power between harvesters and this increases the likelihood of “risk pools” forming among harvesters and staying together over the long term. The presence of an area management provision is somewhat unclear, though it may reduce gross revenues and overall harvest volume. If large-scale gear switching occurs off the central California coast, as has been hypothesized, such gear switching may mean several species of flatfish are not fully harvested. Other elements differ in scenario 4 but do not appear to result in changes to profitability or risk.

Individual harvesters face risks in the non-whiting trawl fishery because of low trawl allocation species and the presence of thin markets. These same risks are not apparent in the Pacific whiting sectors, although there are other risks for these harvesters. The fact that there is a common bycatch limit for all three whiting sectors imposes risk to all harvesters in the whiting fishery and creates a potential that a de facto race for fish could develop among the Pacific whiting sectors. Such an outcome would tend to eliminate the gains in profit and safety conditions typically expected of rationalization. The presence of this common bycatch pool is likely to result in a fishery that resembles status quo conditions even though harvesters receive allocations of Pacific whiting and form cooperatives.

The effect of scenario 4 on vessel profits and fleet efficiency

Vessel profits are highly influenced by the risk factors (discussed in more detail in the next sub-section) present in this scenario. In the non-whiting trawl fishery, fleet consolidation and the associated cost efficiency are expected to occur to the same degree as that described under the broad-level effects section. This improvement in cost efficiency is likely to be substantial and the outcome is likely to be an improvement in the profitability of non-whiting harvesters even in the face of risks posed by thin markets and low allocation species. The aforementioned potential for a race for fish, due to fishery-wide bycatch limits for Pacific whiting harvesters, is likely to erode the majority – or all – of the gains typically expected from rationalization.

Non-whiting trawl fishery

The individual accountability associated with the alternatives is expected to result in modifications to behavior and gear, which should decrease bycatch of constraining overfished stocks. This reduction in bycatch should lead to higher catch levels of currently under-utilized target species, which provides a further source of profit (in the form of gross revenues) in addition to that which occurs because of fleet consolidation. This effect was described in more detail under broad-level effects, and also in Appendix C.

Exvessel prices received by harvesters in the non-whiting trawl fishery in this scenario are expected to be lower than scenario 2, but similar or equal to those received under scenario 3.b. This is because 25 percent of non-whiting groundfish is allocated to processors. Such an initial allocation is expected to reduce prices paid to harvesters compared to scenarios 2, 3.a and 5 where no initial allocation is made to non-whiting groundfish processors; however, it is unclear how this initial allocation compares to prices paid under status quo conditions. In the long run, the balance of exvessel prices is expected to remain relatively unchanged. That is, exvessel prices are expected neither to change in favor of harvesters or processors compared to prices in the period immediately following the allocation of quota shares. This is because of the accumulation limits specified under this scenario, which are small enough as to act as a de facto limit to the amount of quota that processors are able to acquire. The 1.5 percent control limit over all non-whiting groundfish QS, without a grandfather clause provision, means that the amount of quota allocated to processors will need to be divided among 17 processing companies at a minimum. Several processors that qualify for an initial allocation have their initial allocations truncated by the lack of a grandfather clause. The fact that historically large producers have their initial allocation truncated by the lack of a grandfather clause means that the prices received by harvesters could be different than those prices that would be received under scenario 3.b where some large producers receive relatively large amounts of quota. Regardless of the exvessel prices received, cost savings expected in the non-whiting fishery because of consolidation are expected to be substantial. Even if exvessel prices are lower than in scenario 2, harvesters in this sector should see profits improve over status quo conditions.

The presence of an area management provision that divides species north and south of 40°10’ N. latitude may influence overall gross revenue and harvest volume. As discussed previously, central California harvesters may switch to non-trawl gear. As noted, if this occurs on a large scale, less flatfish could be harvested resulting in a reduction in harvest volume and gross revenue compared to what would be expected to occur if they continued to use trawl gear.

The presence of an adaptive management provision under scenario 3.a should depress profits in comparison to scenarios 2 and 3.b, which do not have this provision. This is because such a provision would presumably be used in a manner that is contrary to an outcome driven by market conditions. Imposing measures that run contrary to a market outcome should in turn have a downward effect on profits since profits are a motivating factor behind market outcomes. However, since this provision uses 10 percent of the available quota, the effect is likely to be minor.

Pacific whiting trawl fishery

In general, a system of harvest cooperatives should allow harvesters in the Pacific whiting sectors to generate higher levels of profit. The reasons for expected profit improvements include flexibility in harvest timing, opportunities for more optimal business planning, and fleet consolidation. Harvest cooperatives also foster greater communication among harvesters, and given the correct set of incentives, such communication may lead to more successful bycatch reduction and a greater potential that harvesters will fully attain their allowable catch of target species.[26] The ability for harvesters in a cooperative structure to share catch among themselves provides a framework for harvesters to consolidate, like in an IFQ program, with some harvesters potentially choosing to opt out of harvest activity and allow another harvester to catch his/her quota, or catch history, assignment. Catch history assignments in the shoreside and mothership sector provide a form of assurance that individual harvesters have access to a given amount of resource, making long-term business planning decisions easier to make in comparison to status quo.

While the accumulation limits for harvesters in the Pacific whiting fishery are relatively small in this scenario, the limits are large enough that they are not expected to restrict fleet consolidation. Indeed, a 15 percent shoreside whiting limit, a 20 percent mothership limit, and a 10 percent mothership catcher vessel limit could lead to substantial fleet consolidation and a few companies controlling the majority, or even all, of the harvest and processing activity.

The relationship between Pacific whiting harvesters and processors that is formed in this scenario is different from that relationship established by issuing both sectors IFQ. The exvessel prices that develop through a harvester-processor linkage could very well be different from the exvessel prices that arise when both harvesters and processors receive IFQ under scenarios 2 and 3. Harvesters and processors that own IFQ are not limited in who they can buy from and sell to; however, if harvesters and processors are tied to one another in a cooperative structure they are limited in the sale of harvest privileges and fish (though the linkage can be broken with some effort). This linkage means that negotiation and relationships that exist between the harvester and processor are likely to have a large influence over exvessel prices in the short term, as opposed to a market-driven outcome. Over the long term, harvesters and processors can break that arrangement if the harvester fishes in the "non-cooperative" portion of the fishery, though this fishery is a competitive, race for fish fishery, which makes it unattractive and arguably less profitable. This means that over the longer term, harvesters can break linkages and establish a linkage to another processor with a more favorable exvessel price. However, breaking that linkage may come at a cost, meaning that harvesters may elect to maintain the existing linkage and agree to sub-optimal exvessel prices if the perceived cost of breaking the linkage and participating in the non-cooperative fishery is too great. That aside, it is unlikely that harvesters would agree to exvessel prices that compromise their ability to generate profits since they have the opportunity to break linkages and this plays to their favor. Therefore, since relationships are likely to have a large degree of influence over exvessel prices in this scenario, the effect of a cooperative structure with harvester-processor linkages on exvessel price is unclear. It is unlikely, however, that if prices decline, they will decline to a level that jeopardizes profit in the harvesting sector.

The distribution of harvest opportunities under a cooperative structure with harvester-processor linkages is more similar to the distribution that occurs with 100 percent of the initial allocation going to permits than a distribution that allocates to both harvesters and processors. This is because under a cooperative system with processor linkages, the harvester still controls the opportunity to harvest the available quantity. That quantity is not made available to processors, as would be the case if IFQ was allocated to processors.

In the shoreside whiting fishery, the linkage of harvesters to (potentially) multiple processors can create problems in negotiations with processors over deliveries and delivery timing. For example, if one harvester begins fishing at the start of the year and delivers that catch to processor A, but then is preempted by bycatch constraints before making deliveries to processor B, then an argument can be made that the harvester did not reach his/her obligation to deliver to processor B, and in fact delivered

26 However, as will be discussed in later sections, the fishery wide bycatch limits specified in this scenario make successful bycatch management on the part of industry uncertain, and perhaps even unlikely.

100 percent of his/her catch to processor A which may appear to violate the processor linkage provisions. Such complexities may lead to difficulties negotiating with processors over harvest timing and may lead to strategic arrangements which may not exist if a harvester is only connected to a single processor.

An adaptive management provision, as in scenarios 3.a and 5 (but for a single shoreside sector only), would tend to reduce overall profit. As discussed previously, the concept of an adaptive management provision implies that it be used in a manner contrary to a market-driven outcome. Since market driven outcomes are motivated by profit, such provisions would tend to reduce profit in the fishery.

While the above factors speak generally to the fact that profits should improve for harvesters under a cooperative structure, the common bycatch limit that exists in this scenario may very well eliminate the gains expected from the implementation of harvest cooperatives. This effect is discussed in more detail in the following section.

Table 4-14. Summary of the effect of scenario 4 on profits

Non-Whiting Catcher Vessels	Fleetwide profit expected to increase as a result of increased target species catch and fleet consolidation. Exvessel prices expected to be lower than scenario 2 because of the initial allocation made to processors, however, gear switching and flexible harvest timing provides opportunities to capitalize on favorable market conditions. Area management may result in lower exvessel revenue than would otherwise occur if large-scale gear switching occurs in certain areas of the coast because flatfish catch may be foregone. An adaptive management provision will tend to have a minor, downward effect on profit because it works counter to a market system. The risk associated with managing some species with IFQ makes profit expectations uncertain. Accumulation limits do not appear to restrict consolidation.
Shoreside Whiting Catcher Vessels	Cooperative structure should theoretically improve profitability in the fishery, but the risks posed by the level of bycatch management specified in this scenario jeopardize profits to a great degree.
Mothership Catcher Vessels	Cooperative structure should theoretically improve profitability in the fishery, but the risks posed by the level of bycatch management specified in this scenario jeopardize profits to a great degree.

The distribution of vessel profits under scenario 4

The distribution of profits seen in scenario 4 is similar to those in scenarios 2 and 3 in some respects, yet different in other respects. Harvesters fishing around areas with a relatively high presence of overfished stocks are likely to be disadvantaged and be less able to access their target species, like in scenario 2. Other factors play into the distribution of profits – namely the presence of area management. The division of species at 40°10’ N. latitude maintains a division of catch north and south of that boundary. While harvesters are free to travel across the boundary to access northern quota and southern quota (so long as they hold quota pounds for northern and southern species), it is likely that such area management will tend to direct profits to harvesters located in different geographic areas than if there was no area management simply because harvesters are located in different areas and are more likely to fish in an area near their location.

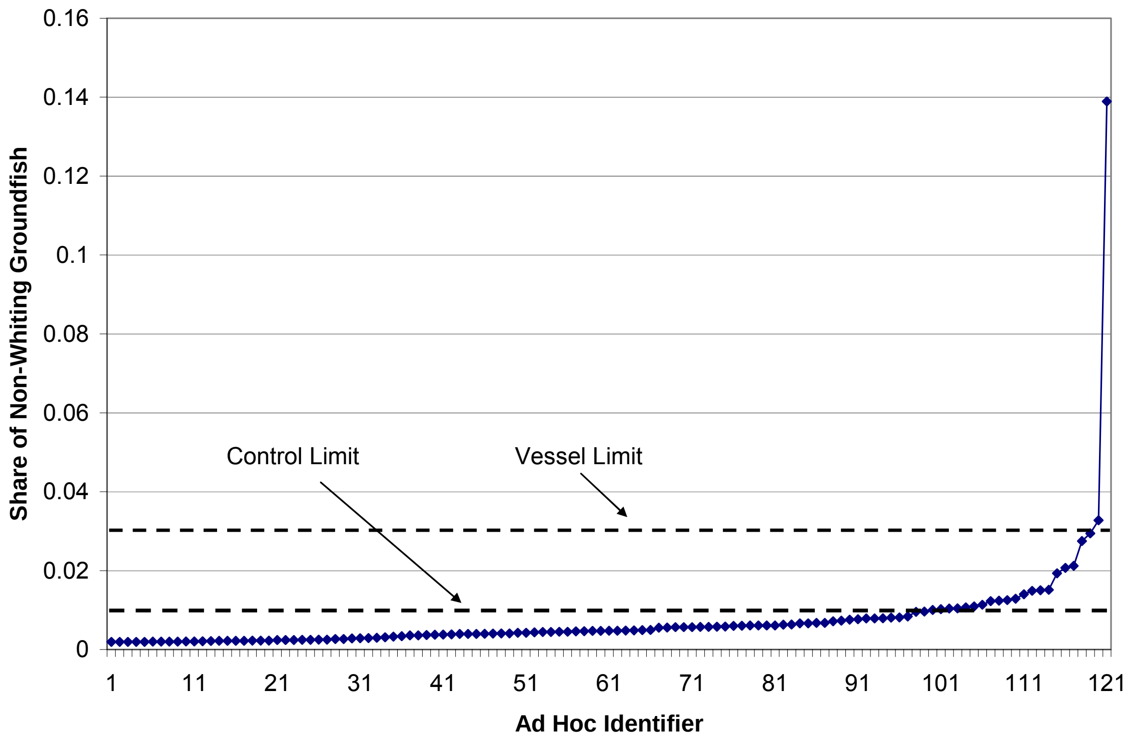


Figure 4–26. Distribution of aggregate non-whiting quota shares and accumulation limits under scenario 4.

In the shoreside whiting fishery, 37 entities are estimated to receive catch history designations under this scenario. All of the entities receive less than the accumulation limit, but the largest entity receives more than twice as much as the second largest entity. A handful of entities stand to receive catch history designations that are close to zero percent of the shoreside whiting quota.

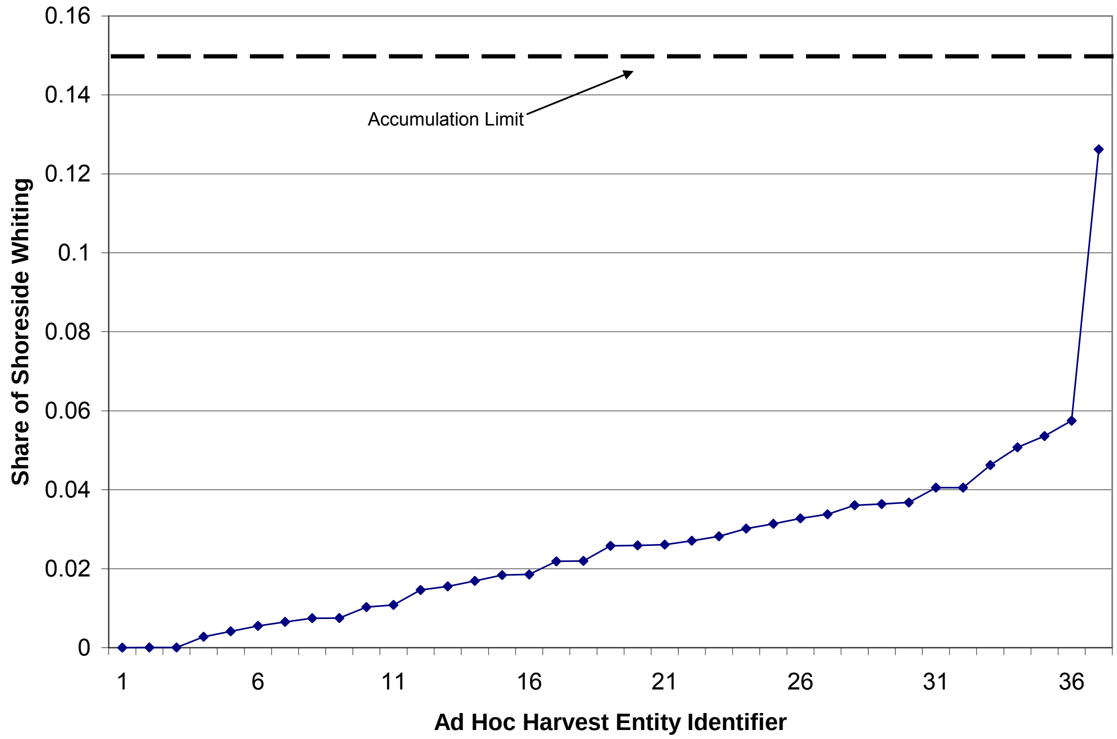


Figure 4–27. Distribution of shoreside whiting catch history and accumulation limit in scenario 4.

In the shoreside whiting fishery, several harvesters are connected to more than one processing company. Thirty-six shoreside whiting harvesters are connected, at least in part, to the three largest processing companies. Those companies are linked to over 80 percent of the shoreside whiting catch history.

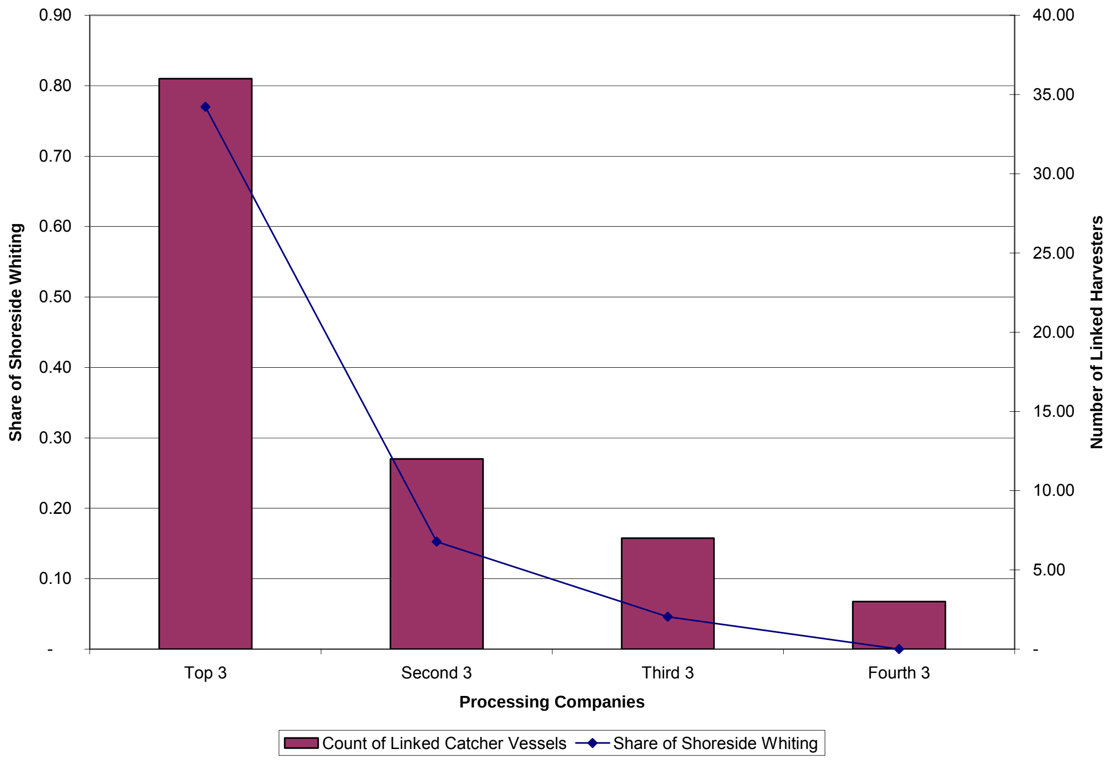


Figure 4–28. Harvester processor linkages in the shoreside whiting sector under scenario 4.

In the mothership sector, 29 entities stand to receive catch history designations of mothership whiting. . The largest entity receives just over 10 percent of the catch history designation, while the second largest entity receives close to 7 percent. Many entities receive between 3 percent and approximately 6 percent of the designation. The smallest entity receives approximately 0.5 percent.

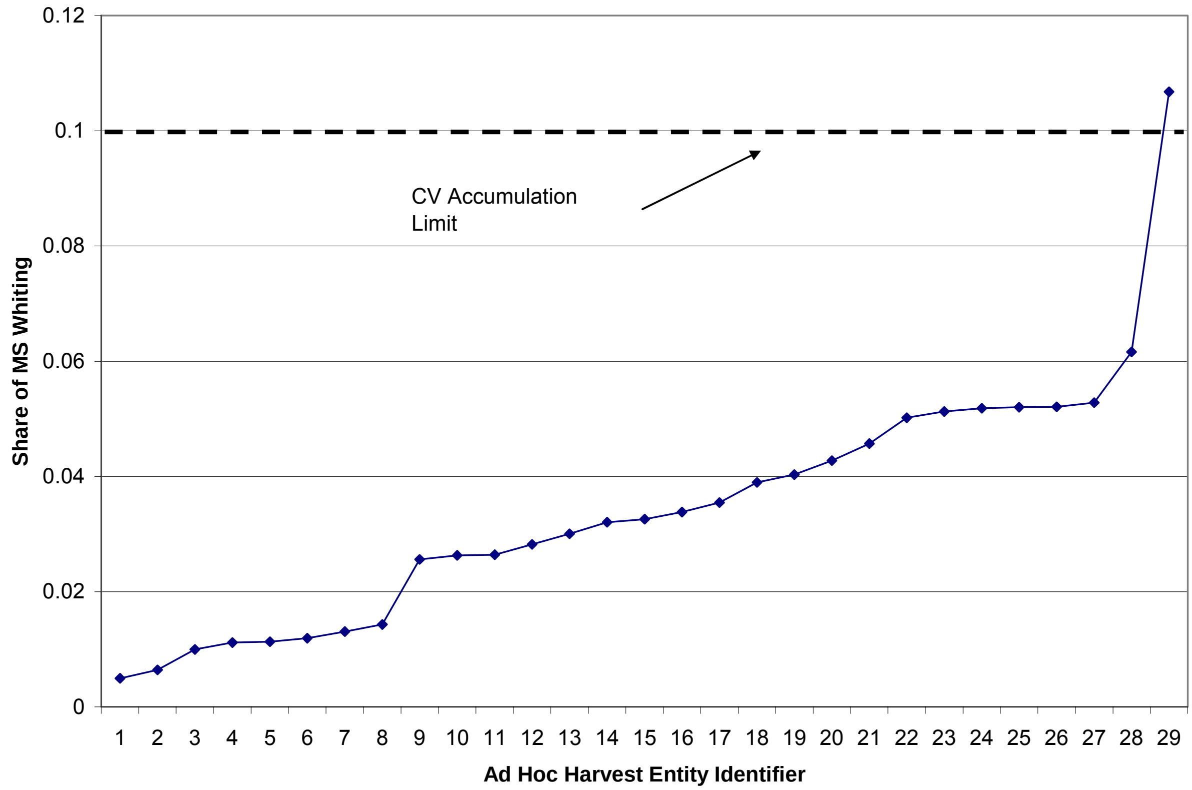


Figure 4–29. Distribution of catcher vessel mothership catch history under scenario 4.

Mothership catcher vessels are connected to 6 different mothership companies through the MS linkage provision. One mothership company is connected to 8 catcher vessels while the smallest company is connected to 2 catcher vessels. These connections assume the most recent delivery year prior to 2007 is the basis for establishing the mothership linkage.

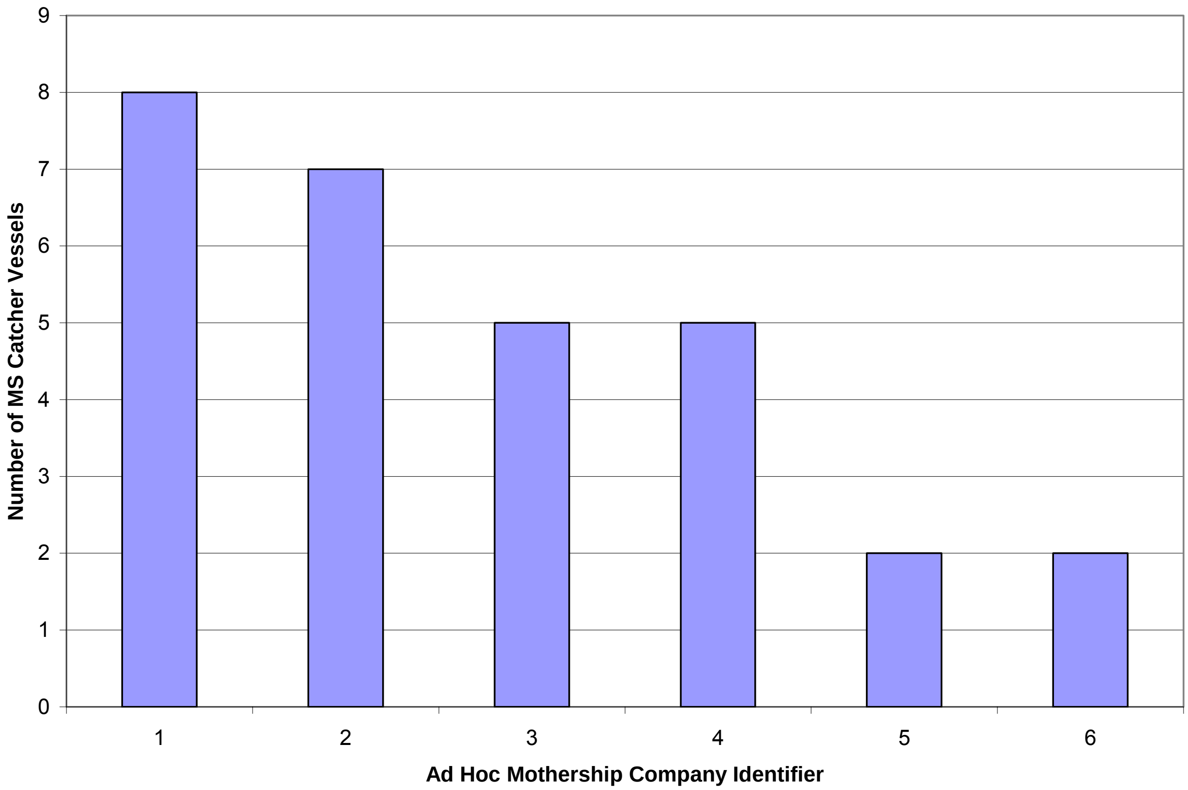


Figure 4–30. Catcher vessel mothership linkages under scenario 4.

The Risk to profits posed by scenario 4

<u>Non-whiting trawl fishery</u>

The risk to harvester profits in the non-whiting sector under this scenario from species with low trawl allocations and the presence of thin market conditions is largely the same as under scenarios 2 and 3. Scenario 4 differs from scenarios 2 and 3 in the initial allocation rules specified for this scenario, in the lack of a carry over provision, and in the establishment of four trawl sectors.

In order to manage risk, it is likely that harvesters in the non-whiting sector will form voluntary risk sharing arrangements, or pools, where harvesters are expected to transfer quota among themselves to cover unexpected catch events – particularly for low OY or thin market species for which quota may be expensive. In comparison to all other scenarios, the initial allocation rules specified under this scenario, and the lack of a grandfather clause, are arguably the most conducive to the development of such risk sharing arrangements. This is because the initial allocation is more equal than in scenarios 2 and 3. This is particularly true for overfished stocks because the initial allocation is made on a basis that is relative to the allocation of target species (bycatch rate allocation). In combination with the lack of a grandfather clause this limits the amount of overfished stocks any one entity can hold. As discussed in previous sections, this facilitates the formation of voluntary risk pools that are stable over the long term.

The lack of a carry over provision in this scenario increases risk to individual harvesters. Since harvesters cannot carry over a deficit from one year to the next, harvesters would need to purchase quota pounds to cover an unexpected catch event that puts them into a deficit condition, or face an enforcement action. Both of these outcomes could prove quite costly, and this potential cost increases the risk of fishing in areas where low allocation species and thin market species are found. This increases the likelihood that harvesters will forego harvest opportunities for some target species that are associated with overfished and nearshore rockfish species in order to avoid such risks.

Pacific whiting trawl fishery

Under this scenario Pacific whiting is allocated to shoreside and mothership harvesters, but no other species are. Bycatch species are covered through a common bycatch limit that stretches across harvesters in all three Pacific whiting sectors. This means that there is no individual accountability for bycatch species, and transfers of bycatch species quota cannot occur. A quota market for those species cannot develop under this scenario and the risk to individual harvesters posed by markets for low allocation and thin market species is low because they will not face the possibility of purchasing costly quota due to unexpected catch events. However, there is a collective risk, which can impact many, or all, harvesters in the Pacific whiting sectors.

The fact that all three sectors of the fishery are likely to close if one or more bycatch limits are reached creates the conditions necessary for a de facto race for fish, as described previously. Under such conditions, more capital is likely to be employed than necessary (increasing costs in the fishery) and the greater business planning typically associated with rationalization is likely to be compromised. Under such conditions, gross revenues in the fishery are put at risk, and the cost efficiencies expected because of fleet consolidation are not likely to be realized. When combined with the lack of business planning possible under such Olympic conditions, the end result of this scenario on Pacific whiting harvesters is likely to be highly similar to status quo conditions with higher harvesting costs than necessary, harvest timing that is less than optimal, and the possibility that several harvesters could see their catch opportunities preempted by other harvesters because of the common bycatch limit.

Whether or not harvesters engaged in Pacific whiting harvest opportunities are able to agree on a strategy to successfully manage bycatch to the benefit of all the harvesters involved in the fishery will determine the success of this common bycatch limit. If existing conditions serve as a guide, the number of harvesters engaged in the whiting fisheries is sufficiently large to limit the ability that these harvesters will agree to successful bycatch management conditions.

The establishment of four trawl sectors does not necessarily impose risks to individual shoreside Pacific whiting harvesters under this scenario like the non-whiting sector. Non-target catch in the shoreside whiting fishery is bundled with the at-sea whiting fisheries through a bycatch limit that is common to all three whiting sectors. If the shoreside whiting fishery was separated from the non-whiting fishery through the establishment of four sectors and was accountable for its own sector-specific catch, then the establishment of four sectors would impose risks like those in the non-whiting sector because of the hard allocations made and the limited flexibility that exists because of those hard allocations.

Table 4-15. Summary of the effect of scenario 4 on risk to profits.

Non-Whiting Catcher Vessels	High level of risk created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of overfished species quota shares based on a bycatch rate, combined with the lack of a grandfather clause – particularly for overfished species – creates the most favorable conditions for forming risk pools among all scenarios. The presence of 4 trawl sectors may jeopardize the ability of harvesters to achieve the full trawl sector

	allocation of some target species.
Shoreside Whiting Catcher Vessels	The risk associated with setting a fishery-wide bycatch limit is likely to erode, or eliminate, the gains expected of rationalization if bycatch limits are constraining. This may lead to a fishery that resembles status quo, Olympic fishery conditions even though cooperatives form among harvesters.
Mothership Catcher Vessels	The risk associated with setting a fishery-wide bycatch limit is likely to erode, or eliminate, the gains expected of rationalization if bycatch limits are constraining. This may lead to a fishery that resembles status quo, Olympic fishery, conditions even though cooperatives form among harvesters.

Fishing vessel safety

Safety conditions in the non-whiting sector are expected to be very similar to those in scenarios 2 and 3. In the non-whiting sector, safety improvements should occur because of the increase in profitability expected with this scenario. Such improvements in profitability are expected to improve maintenance on vessels, and this improved maintenance should lead to less hazardous conditions. In addition, enhanced harvest flexibility created by rationalization decreases the potential that harvesters will feel the need to fish during unfavorable weather conditions.

Because of the bycatch management conditions in the whiting fishery under this scenario, harvesters in the mothership and shoreside whiting sectors are not likely to see an improvement in safety conditions over status quo. The incentives given to harvesters under this scenario encourage Olympic-like behavior that adversely impacts potential profit and provides incentives for harvesters to fish during times of unfavorable weather conditions. However, in the chance that harvesters are able to form successful bycatch management plans, revenues should be expected to increase, fishing patterns should be expected to be more rational, and therefore safety conditions should be expected to improve.

Table 4-16. Summary of the effect of scenario 4 on safety.

Non-Whiting Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	No change from status quo.
Mothership Catcher Vessels	No change from status quo.

4.7.3.6 *Scenario 5*

The effect of scenario 5 on harvesters can be described as falling between the effects seen in scenarios 2 and 3 and scenario 4. The way in which scenario 5 differs from the other scenarios is predominately the result of the initial allocation formula, the presence of a grandfather clause, the lack of an initial allocation to processors, the combination of both shoreside sectors into one, bycatch management at the co-op level in the at-sea fisheries, and the presence of an adaptive management provision. The presence of an area management provision may have an effect on exvessel revenue if large-scale gear switching occurs off specific areas of the coast. Other elements of this scenario differ, but do not appear to have a noticeable effect on the outcome.

Shoreside whiting and non-whiting harvesters are expected to see profits improve under this scenario, but see risks associated with low allocation and thin market species as in other IFQ scenarios. The presence of a carry-over provision reduces this risk somewhat, as does the bundling of both shoreside sectors into one sector. This merging of the two shoreside sectors provides the opportunity that harvesters can trade quota among themselves when necessary to achieve such outcomes as the covering of catch deficits.

Harvesters in the mothership sector see profits improve under this scenario. Risks to individual harvesters are higher than under status quo because individual cooperatives are held accountable for bycatch, but risks to the collective fleet (risk of a race for bycatch) are minimal. The individual risk posed by this scenario can be overcome by the allowance, and development, of inter-cooperative agreements to manage bycatch. Such agreements allow cooperatives to share bycatch, thereby spreading the risk of unexpected catch events.

The effect of scenario 5 on vessel profits and fleet efficiency

Non-whiting trawl harvesters

The profits that non-whiting harvesters make under this scenario are expected to be largely similar to those seen in scenario 2. This profit comes from fleet consolidation, higher catch of under-utilized target species, and from increased negotiation power over exvessel prices with processors compared to status quo. Higher exvessel prices are the result of the initial allocation being made to limited entry trawl permit holders. Over the long run, the negotiation power is expected to remain in the harvesters favor because of the accumulation limits. These accumulation limits result in a de facto limit on the amount of quota that the processing sector can acquire over the longer term. Since scale economies tend to result in a fewer number of processors than there are harvesters, small accumulation limits make it difficult for the processing sector to acquire much quota in the aggregate. While these accumulation limits appear to restrict the amount of quota that the processing sector may acquire over the longer term, they do not appear to restrict fleet consolidation, and therefore they do not appear to restrict the cost savings associated with the expected degree of fleet consolidation. The minimum number of vessels remaining in the fishery under this scenario is 23.

Gear switching provides another source of potential revenue because it allows vessels to capitalize on market conditions that may be more favorable for non-trawl caught groundfish. However, gear switching in combination with an area management provision included under this scenario may mean that catch and exvessel revenues generated are less than expected. If large-scale gear switching occurs off one particular area of the coast, the catch of flatfish stocks may be foregone because fixed gear is relatively less effective at catching those species. Since the area management provision does not allow the harvest of that quota in another area, trawl vessels may find it difficult to access those stocks because of long transit distances to fishing grounds where area-specific IFQ could be used. For example, trawl vessels in the north may, at times, travel south to harvest available flatfish, but the large travel cost involved may act as a financial deterrent, meaning that much of the harvest of flatfish in the southern area is foregone.

The adaptive management provision would have the same effect as described for scenarios 3 and 4: it tends to put downward pressure on profits. As noted previously, since adaptive management only uses 10 percent of the quota, the effect should be minor.

As under all the other scenarios, while increased levels of profit are expected, there is some uncertainty associated with the level of profit because of the presence of low allocation and thin market species, and the response that harvesters will have to such conditions.

Shoreside whiting trawl harvesters

Pooling of a common IFQ for shoreside whiting and non-whiting trawl harvesters and the initial allocation formula will make the effects of this scenario different from all the other scenarios. As discussed under the section describing the expected effects of scenario elements, establishing four trawl sectors may make it difficult to attain the full trawl allocation, while establishing three trawl sectors will allow quota trading and enhanced opportunities between both shoreside sectors. Shoreside whiting harvesters should see profits improve over status quo conditions because of fleet consolidation, enhanced operational flexibility, and enhanced opportunities for business planning. Because 50 percent of the shoreside whiting allocation is made to processors, exvessel prices for shoreside whiting harvesters should be lower than under scenarios 2 and 3.a where there is no initial allocation to processors. Some processors hold limited entry trawl permits, and those processors will receive quota allocated both to permits and to processors. The following figure shows the estimated share of shoreside whiting that would be allocated to processors and harvesters under scenario 5.

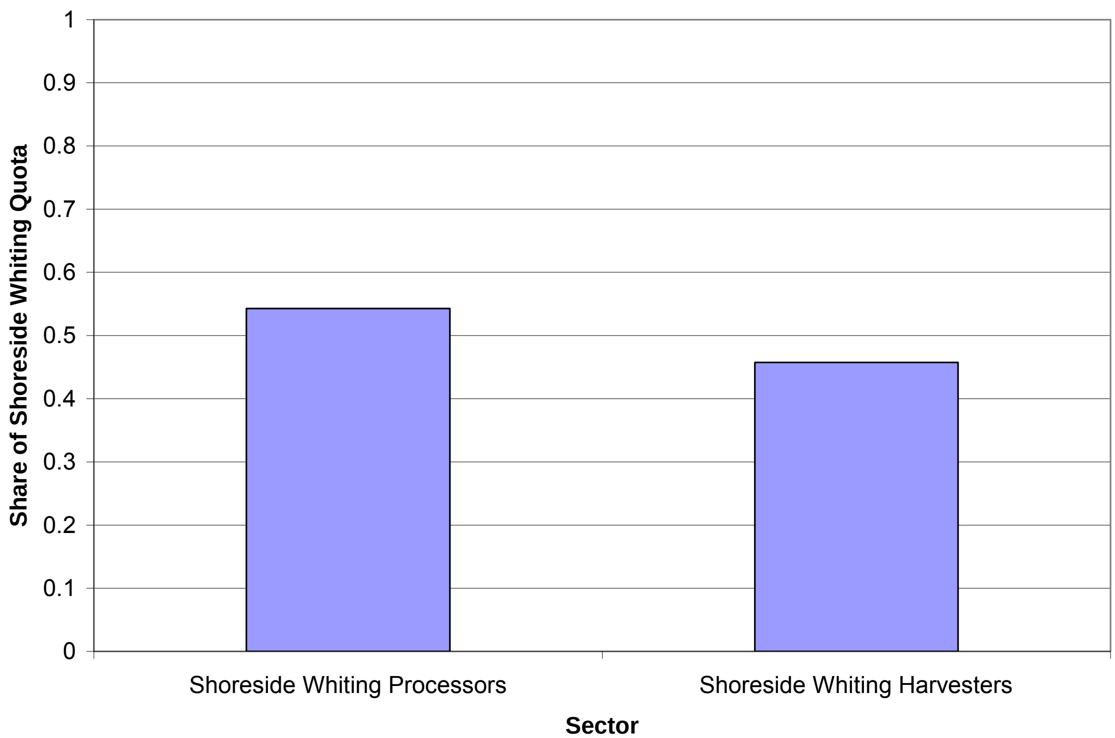


Figure 4–31. Allocation of shoreside whiting quota to harvesters and processors under scenario 5.

The same risks when IFQ is applied, of thin market and low allocation species, may cause shoreside whiting harvesters to fish further out along the continental shelf and slope and incur higher costs than under status quo. These higher costs will put downward pressure on profits.

This distribution of quota to processors will alter the distribution of harvest opportunities available to harvesters compared to a scenario where all of the allocation is granted to permits. This concept is discussed in more detail in the next section.

Mothership trawl harvesters

Harvesters in the mothership sector see profits improve under this scenario because of fleet consolidation and because of enhanced flexibility in harvest timing and business planning. The certainty of these greater profits is highest under this scenario compared to all other scenarios because the combined individual and collective risks associated with this scenario results in the lowest overall risk compared to all other scenarios, including status quo. This concept is discussed in more detail under the sub-section describing risk.

This scenario includes the harvesters/processor linkage, but unlike scenario 4 only for 50 percent of the catcher vessel catch history is obligated to the linked processor. This partial linkage allows harvesters to shop around and use the market for half of their catch history, thus providing harvesters with a mechanism to attain higher exvessel prices than under scenario 4. Establishing only a partial linkage injects market mechanisms into the relationships between motherships and catcher vessels. This will tend to change the manner in which negotiations occur over the linked catch history since harvesters can leverage those negotiations with the unlinked catch history. Therefore, it is reasonable to expect that the exvessel prices for linked processor deliveries would be higher than under scenario 4. Exvessel revenue would also be higher than under scenario 3.b where 50 percent of the IFQ is given to processors. Under scenario 3.b, processors have the ability to find a harvester willing to prosecute their quota at prices that the processor finds favorable. Under this scenario, where only a portion of the catch history is connected to motherships, those processors/motherships do not have control over catch history and therefore have a more limited ability to negotiate prices. This would tend to work in the harvesters favor.

Table 4-17. Summary of the effect of scenario 5 on profits.

Non-Whiting Catcher Vessels	Fleetwide profit expected to increase as a result of increased target species catch and fleet consolidation, though actual estimates are made uncertain because of the risks posed by thin market and low allocation species. Exvessel prices expected to be higher than status quo because of the initial allocation made to permits and the negotiation power harvesters will have over exvessel prices as a result. Gear switching and flexible harvest timing also provide opportunities to capitalize on favorable market conditions. Area management may result in lower exvessel revenue than would otherwise occur if large-scale gear switching occurs in certain areas of the coast because flatfish catch may be foregone from those areas. An adaptive management provision will tend to have a minor, downward effect on profit because it works counter to a market system. Accumulation limits do not appear to restrict fleet consolidation.
Shoreside Whiting Catcher Vessels	Fleetwide profit expected to increase as a result of fleet consolidation and improvements in harvest timing flexibility. Exvessel prices expected to be lower than in scenario 2 because of the amount of quota allocated to processors. The risks posed by thin market and low allocation species may force harvesters to incur greater costs as they travel further in order to avoid areas where these species are found.

Mothership Catcher Vessels	Fleetwide profit expected to increase as a result of fleet consolidation and improvements in harvest timing flexibility. Some limited uncertainty regarding potential profits exists because of risk associated with bycatch management at the cooperative level, and because of the presence of a non-cooperative fishery.

<u>The distribution of profits under scenario 5</u>

As in the other scenarios, the effect of individual accountability will tend to disadvantage those harvesters that have historically fished in areas where constraining stocks are more abundant. This may distribute the benefits of trawl rationalization toward those harvesters that fish in areas where such stocks are less abundant and away from harvesters that fish in areas where they are more abundant. This concept was discussed in more detail under broad level effects.

In the non-whiting trawl sector, the distribution of harvest privileges is similar to that of scenario 3.b; however, in contrast to scenarios 3.a and 4, because the adaptive management provision is used for more than just adversely impacted processors in this case, the geographic distribution of these shares is expected to be different. In cases where adaptive management is used to encourage the use of bycatch friendly gear, the distribution of adaptive management quota may go toward harvesters that would use bycatch friendly gear regardless of the presence of adaptive management. For example, those harvesters that are located off central California and northern Washington may elect to switch to fixed gear because of public relations issues, market conditions, and bycatch reasons. Allocating adaptive management to these harvesters would allow them to harvest more groundfish than otherwise would be the case, but may not induce additional vessels to switch to fixed gear. In areas where the aforementioned incentives for vessels to switch to fixed gear are not present, the use of adaptive management quota may create another incentive for gear switching. This redistribution of shares would tend to provide access to higher amounts of groundfish to those harvesters that are recipients, and may in turn provide a redistribution of profits toward those harvesters.

In the shoreside whiting fishery, the use of adaptive management quota to encourage bycatch friendly gear is not likely to induce gear switching from trawl gear to another type of gear because Pacific whiting harvesters rely on high volume. It may, however, encourage the modification of midwater trawls so that they successfully reduce the bycatch of overfished stocks or salmon. Distributing adaptive management quota to those harvesters that alter their midwater trawls may provide benefit to those harvesters, but it is likely to reduce overall, fleetwide profit because the use of adaptive management encourages an outcome that is contrary to the one purely driven by the market. If a modified midwater trawl gear has a lower catch rate of whiting, but also reduces salmon bycatch, harvesters may only use that gear as long as they are recipients of adaptive management quota. If that adaptive management quota is redirected to another use, those harvesters may revert to the unmodified, higher bycatch gear. Therefore, the effect that an adaptive management provision has on profits in this case is only as permanent as the location/distribution of that adaptive management quota.

The initial allocation of IFQ (applicable to the shoreside sectors only) with equal sharing of trawl buyback catch history will allocate shoreside whiting to harvesters in the non-whiting trawl fishery that have not historically participated in the whiting fishery, and allocate non-whiting groundfish to shoreside whiting harvesters that have not historically participated in the non-whiting fishery. The following figures show that the number of non-whiting quota recipients is 121 (compared to 116 when no buyback history is shared). The number of shoreside whiting quota recipients is 139, though approximately 90 of these recipients receive close to zero quota shares while the largest 5 recipients comprise 47 percent of the quota shares. The distribution of quota/catch history in the mothership sector under this scenario is the same as in scenario 4 (except for the accumulation limit) and is therefore not repeated here.

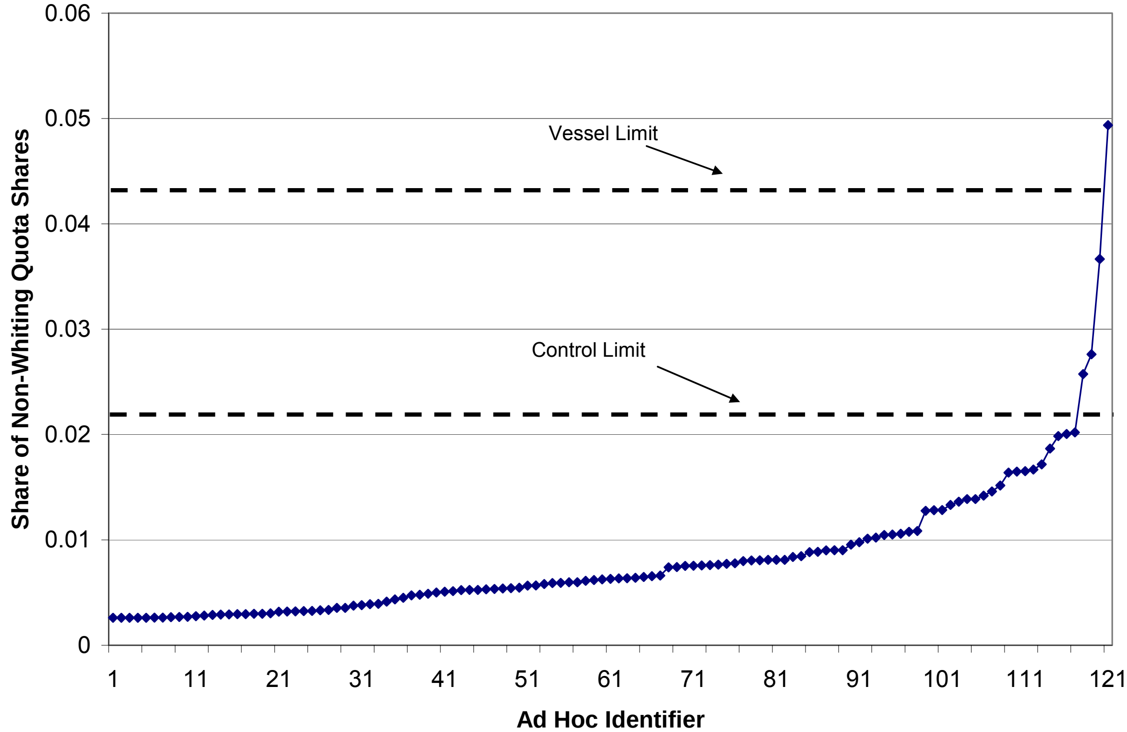


Figure 4–32. Distribution of aggregate non-whiting quota shares and accumulation limits under scenario 5.

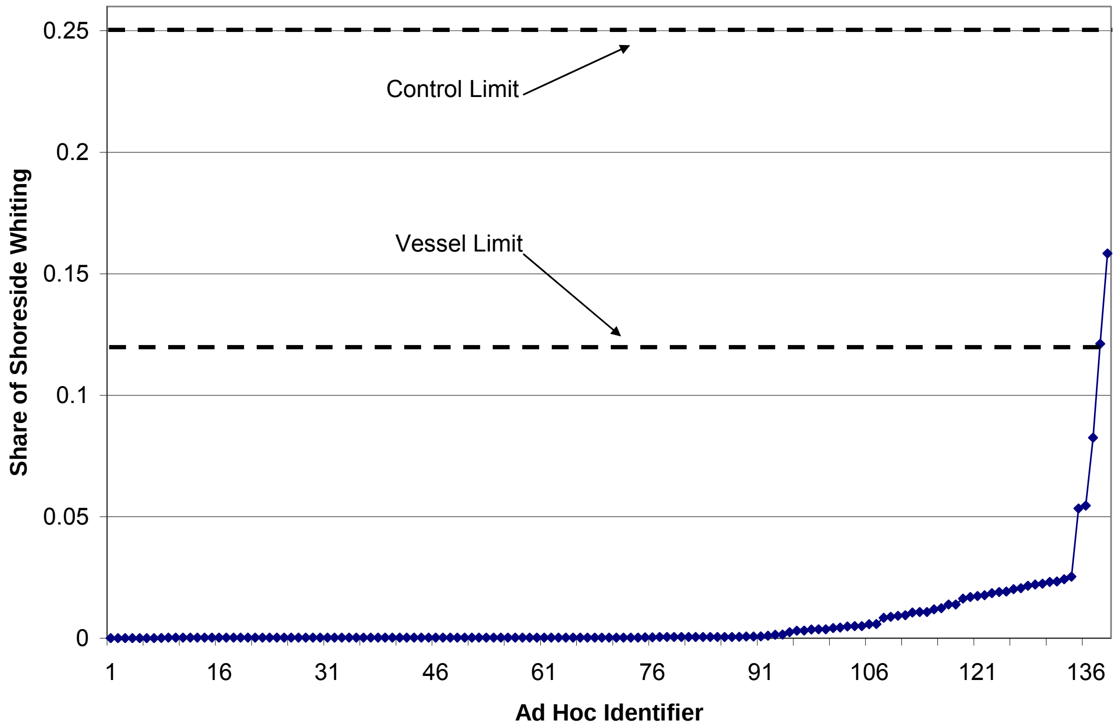


Figure 4–33. Distribution of shoreside whiting quota under scenario 5.

The distribution of catch history to mothership catcher vessels under scenario 5 is the same as under scenario 4, but with higher accumulation limits. In addition, only half of the catch history is linked to a mothership. Under this scenario no catcher vessels would be constrained by the accumulation limit.

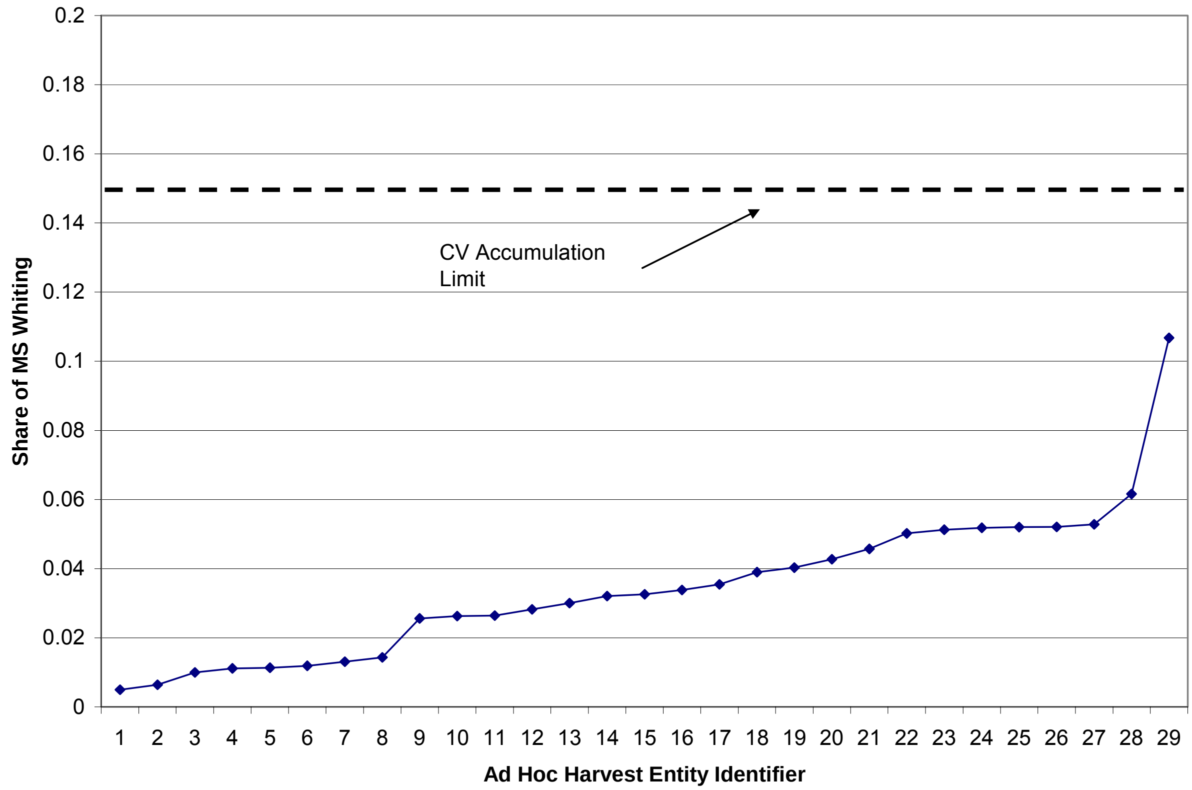


Figure 4–34. Distribution of mothership catcher vessel catch history under scenario 5.

The risk to profits posed by scenario 5

<u>Non-whiting trawl harvesters</u>

As under scenarios 2, 3, and 4, the presence of thin market and low allocation species, harvesters may avoid fishing in nearshore and continental shelf areas, thus foregoing the harvest of target species that exist in these areas. This disincentive may be counter-balanced by the ability for non-whiting trawl harvesters to form and maintain "risk pools," which is much greater in this scenario compared to scenario 2 and 3, but is less than scenario 4. The allocation of overfished stocks based on a bycatch rate results in a more equitable distribution of IFQ for these species. The equal sharing of buyback catch history has the same effect for non overfished species. Overall, these two provisions tend to put individual harvesters in a more equal negotiation stance, thus fostering the ability of harvesters to form mutually beneficial risk pooling arrangements. However, in contrast to scenario 4, the inclusion of a grandfather clause (particularly for constraining stocks) counterbalances more equitable distribution of IFQ; that is why this scenario is judged to be less conducive than scenario 4 for the formation of risk pools.

Like scenarios 2 and 3, three trawl sectors makes it more likely that harvesters will be able to attain the full trawl sector allocation than under scenario 4, where there are four trawl sectors. The catch of sablefish in the shoreside whiting sector in particular varies fairly substantially from year to year. Since this scenario has three trawl sectors (one shoreside sector) it is likely that this scenario has a higher probability of attaining the trawl sector allocation than scenario 4.

Shoreside whiting trawl harvesters

The presence of low allocation and thin market species creates risk to individual harvesters in the shoreside whiting fishery. This risk would have similar effects on the geographic distribution of fishing as described for other sectors that are managed with IFQs. These effects include possible avoidance of areas where constraining species are found, and longer travel distances in order to reach low bycatch areas. These risks are the same under this as under scenarios 2 and 3. Like scenarios 2 and 3, three trawl sectors creates a single IFQ pool for shoreside whiting and non-whiting harvesters and gives harvesters the flexibility to transfer quota as needed through the market. This allows harvesters to be relatively adaptable to changes in catch conditions from year to year.

Mothership trawl harvesters

In contrast to scenario 4, collective risk (risk of a race for fish because of bycatch) to harvesters in the mothership sector is minimal under this scenario because the allocation of bycatch species to co-ops insulates harvesters in separate co-ops from one another. The presence of the non-cooperative fishery poses some risk to harvesters in the cooperatives because the non-cooperative fishery is structured in a manner that creates the incentives necessary for an Olympic fishery to develop. Harvesters fishing under such conditions are less likely to fish in a manner that effectively reduces bycatch, thus increasing the potential of a disaster tow occurring. This risk posed to the cooperatives can be overcome through the establishment of provisions like a non-cooperative fishery "bycatch buffer" or through more stringent area management conditions. For example, a bycatch buffer placed on the non-cooperative portion of the fishery would insulate the cooperatives if a disaster tow occurs in the non-cooperative fishery that causes that portion of the fishery to exceed its bycatch amount.

Individual risk to mothership harvesters (the risk to individuals posed by unexpected catch amounts of bycatch species) is lower in this scenario than in scenarios 2 and 3 (IFQs) because of the lack of individual quota for thin market and low allocation species and the associated costs and/or penalties associated with deficit conditions associated with an IFQ program. However, there are some risks to individual harvesters–and harvesters associated with one another in a cooperative–through the bycatch limits that are set at the cooperative level. Bycatch limits established at this level reduce the spreading of individual risk that occurs if bycatch limits apply to the whole whiting sector as under scenario 4 and as a result impose more burden – and risk – to the individual harvesters in a cooperative. This risk is imposed on other harvesters in that cooperative. If one harvester has an unexpectedly large catch event of a bycatch species, the entire cooperative may be shut down and other harvesters in that cooperative may have their fishing opportunity preempted by that event. Such an event can be avoided through the presence of inter-cooperative agreements to manage and share bycatch. This type of an agreement would tend to develop among cooperatives that find it mutually beneficial to do so. This agreement would spread the risk of unexpected catch events across more participants, thus reducing the likelihood that harvesters will have their opportunities preempted by the unexpected catch of another harvester because the larger collective bycatch limit established through the inter-cooperative agreement may be able to absorb such events. In addition, bycatch limits set at the cooperative level will most likely lead to the development of cooperative agreements that impose a high degree of individual accountability of bycatch on harvesters within that cooperative. This will likely occur because cooperatives will need to internalize the management of bycatch, and the likelihood of one cooperative forming an inter-cooperative agreement with another cooperative may very likely depend on the strength and success of the bycatch management plan contained in the individual cooperative agreements.

Table 4-18. Summary of the risk to profits posed by scenario 5.

Non-Whiting Catcher	High level of risk to profits posed by the presence of thin market and

Vessels	low allocation species. The allocation of overfished stocks on a bycatch rate creates conditions that are conducive to the forming of risk pools, though this scenario is less conducive to the forming of such pools than scenario 4 because of the presence of a grandfather clause (particularly for overfished stocks) allowing entities to hold in excess of accumulation limits. The existence of three trawl sectors minimizes risk associated with unexpected catch events because of a larger pool of available quota.
Shoreside Whiting Catcher Vessels	High level of risk to profits posed by the presence of thin market and low allocation species. The bycatch rate allocation approach is conducive to the formation of risk pools. The existence of three trawl sectors minimizes risk because of a larger pool of available quota.
Mothership Catcher Vessels	Relatively low risk to individuals and relatively low collective risk (risk of a race for bycatch). Individual risk can be further minimized by the allowance and development of inter-cooperative agreements to manage bycatch across co-ops. Collective risk can be minimized by establishing provisions on the non-cooperative fishery such as bycatch buffers and area management.

Fishing vessel safety

Fishing vessel safety is expected to improve for all harvesters under this scenario with the exception possibly being for those harvesters that elect to participate in the non-cooperative portion of the mothership fishery. While a non-cooperative portion of the fishery also exists in scenario 4, these scenarios differ because of the manner in which bycatch is managed. Safety is improved for harvesters under this scenario because of the expected improvements in profit that tend to lead to better maintenance of vessels. Safety conditions are also improved because of the flexibility in harvest timing that occurs as a result of rationalization and the fact that a successful rationalization program will eliminate the perceived need to fish during hazardous conditions. Those harvesters that participate in the non-cooperative fishery may not see improvements in safety conditions because of the Olympic conditions that exist in this portion of the fishery. Such conditions provide incentives to fish during times of unfavorable weather, thus eroding potential gains in safety conditions. However, assuming that the time spent in the non-cooperative portion of the fishery is temporary, harvesters in the mothership sector should see safety conditions improve except perhaps during times when they are participating in the non-cooperative fishery.

Safety conditions in the non-whiting sector are expected to be the same as under scenarios 2 and 3.

Table 4-19. Summary of the effect of scenario 4 on safety.

Non-Whiting Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	Positive. Vessels in this sector of the fishery are expected to generate higher profits which are expected to lead to improvements in the level and type of maintenance. Rationalization expected to eliminate Olympic conditions, thus allowing harvesters flexibility and eliminating the incentive to fish in hazardous conditions.
Mothership Catcher Vessels	With the exception of those harvesters that spend time in the non-cooperative portion of the fishery, harvesters should see safety

	conditions improve because of improved vessel maintenance and elimination of the incentive to fish in hazardous conditions.

4.7.3.7 *Comparative Summary of the Effects of the Analytical Scenarios*

Scenario 1	• Continuation of depressed status and overcapitalization of fleet. • Minimal individual and collective risks
Scenario 2	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost • Highest exvessel prices of any scenario • Highest individual risk, lowest collective risk.
Scenario 3a	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost • Similar exvessel prices as scenario 2, perhaps somewhat lower • Highest individual risk, lowest collective risk.
Scenario 3b	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost • Lower exvessel prices than scenarios 2, 3a, and 5 in non-whiting sector • Highest individual risk, lowest collective risk.
Scenario 4	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost • Similar exvessel prices in non-whiting sector as Scenario 3b (relatively low) • Exvessel price negotiations in SS and MS whiting unclear. May lead to profit sharing arrangements • Individual risk high, collective risk low in non-whiting (equal to scenarios 2, 3a, 3b). • Individual risk in SS and MS whiting lower than Scenarios 2, 3a, 3b. Collective risk relatively high and similar to Scenario 1
Scenario 5	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost • Similar exvessel prices in non-whiting sector as Scenario 2 (relatively high). • Similar exvessel prices in SS whiting sector as 3b (lower than 2, 3a, and 5) • Exvessel price negotiations in MS whiting unclear but may be higher than Scenario 4. May lead to profit sharing arrangements. • Individual risk in SS whiting and non-whiting high, but collective risk low. • Individual risk in MS whiting moderate. Lower than Scenarios 2, 3a, 3b, but higher than others. Collective risk somewhat moderate

4.8 Impacts to Captain and Crew

In this section we describe the impacts of rationalization on captain and crew employed on limited entry trawl groundfish vessels. This group is comprised of individuals that do not own groundfish trawl catcher vessels, and that do not own limited entry trawl permits. In many cases, individuals operating as a captain of a vessel are also the owner of that vessel and the owner of a permit. Such individuals are not examined in this section, but are examined under the section describing impacts to harvesters. Under the alternatives being considered, captain and crew that do not receive an initial allocation of quota or catch history can purchase quota or catch history. While “new entrants” may be comprised of individuals that are not necessarily captain and crew, new entrants are covered under this section because a review of available literature indicates that most new entrants into rationalized fisheries began their careers as crewmembers.

We begin the section by providing a description of methods used to assess effects on captain and crew and the metrics used to illustrate those effects. Following the description of methodology we discuss the effects of rationalization on captain and crew. Unlike the sections describing impacts to harvesters and processors, this section does not include the effect of each analytical scenario on captain and crew. This is because variations in the analytical scenarios do not appear to noticeably change the impact to captain and crew. Specific elements may have an effect, in which case they are identified and assessed, but overall variations in the analytical scenarios do not appear to noticeably change the outcome.

Finally, we assess cumulative effects. This cumulative effects section briefly summarizes the past and present actions with ongoing effects on captain and crew, and the reasonably foreseeable future actions that are expected to have effects. The effect of these past, present, and reasonably foreseeable future actions are combined with the effect of the analytical scenarios to arrive at the cumulative effect.

4.8.1 Methods for Assessing Impacts

In this section we describe the methodology for assessing the impacts of rationalization on captain and crew. This section summarizes the potential impacts, the reasons why those impacts occur (the mechanisms), and the way in which those impacts are analyzed and modeled (the metrics). **Error! Not a valid bookmark self-reference.** provides an overview of the approach used to estimate the impacts of rationalization on captain and crew. The analytical approach includes 1) potential impacts; 2) mechanisms that relate the proposed action to the potential impacts; 3) measurement criteria or indicators used in assessing each type of impact; and 4) models and data sets used in the analysis. This table shows that the expected impacts to captain and crew are changes in captain and crewmember compensation system, changes in the number of captain and crew jobs, changes in the hours worked, changes in the average income received by captain and crew members, and changes in safety conditions for captain and crew. The mechanisms that are driving changes to the number of captain and crew jobs include fleet consolidation and number of captain and crew per vessel. Changes in the compensation system are driven by changes in the relationships between captain and crew and vessel/permit/quota owners. Changes in the number of hours worked are driven by fleet consolidation and the corresponding change in effort exerted by each vessel. Chages in average income per captain and crewmember are driven by changes in revenue per boat and changes in the compensation system. Changes in the skill set required of captain and crew are largely driven by opportunities for gear switching. Changes in safety are driven by fleet size, vessel operational flexibility, and the financial ability to invest in equipment and conduct vessel maintenance. Each of these mechanisms that are drivers for the potential impacts are measured through listed criteria (third column) which are estimated through the methods described in final column.

Table 4-20. Overview of impacts, mechanisms, and metrics used to compare the effect of the no action alternative and the analytical scenarios on trawl catcher vessels.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods used for Assessing Impacts
Changes in number of captain and crew jobs	Fleet consolidation and number of captain and crew per vessel	Number of vessels and crew per vessel	Fleet consolidation analysis, literature review, discussions with key informants
Changes in shares paid to captain and crew	Changes in the relationships between captain and crew and vessel/permit owners	Captain and crew share	Literature review
Changes in number of hours worked	Fleet consolidation and changes in effort per vessel	Number of vessels and catch/effort per vessel	Fleet consolidation analysis, change in target species catch analysis, and literature review
Changes in average income per captain and crew member	Changes in revenue per boat. Changes in captain and crew shares	Average catch per boat and shares paid to captain and crew	Fleet consolidation analysis and literature review
Changes in the skill-set required	Gear switching	Potential for gear switching to occur	Qualitative assessment and literature review
Ability to become new owners of quota	Changes in the cost of purchasing entry to the fishery	Cost of purchasing quota	Fleet consolidation model, literature review, and qualitative assessment
Changes to safety	Fleet size; vessel operational flexibility; and financial ability to invest in vessel maintenance and safety equipment	Occurrence of safety-related incidents	Qualitative assessment based on literature and expertise of analysts

4.8.2 Effects of Rationalization on Captain and Crew

Rationalization is expected to impact captain and crew in a variety of ways. Captain and crewmembers are primarily impacted indirectly through fleet consolidation, changes in the relationships between captain and crew and vessel/permit/quota owners, and changes in the status and profitability of trawl vessels.

Studies of existing IQ programs have documented changing relationships between crew and captains and vessel/permit owners due to rationalization. For example, in some fisheries the shift to IFQs altered the compensation system from a share of profits system to a wage system. Macinko (1997) discusses impacts on crew who were affected by rationalization when they were not allocated quota. In this study, which was conducted during the first year after implementation of the Alaska halibut/sablefish ITQ program, he noted that some crew benefit and others do not. Those benefiting worked for entities that benefited from the system as a whole, while those who did not benefit worked for vessels that were removed from the fishery as a result of rationalization. However, Macinko (1997) notes that although some crew had lower crew shares, they still earned more under the IFQ program.

Another example is from the British Columbia trawl fishery. In this fishery, the overall share paid to crew is estimated to have declined by 5 percent (from 40 to 35 percent) per vessel, while the overall wages paid to crewmembers is estimated to have increased by 137 percent, primarily because of increases in revenue per vessel {GSGislason, 2008}.

Wilen and Casey (1997) discuss other potential impacts on crewmembers. Consolidation of activities and elimination of vessels and crew will occur as the fishery restructures. Second, on remaining vessels, "inputs" such as the need for crew labor will be reconfigured, reflecting changes in fishing processes. Wilen and Casey write that (particularly in comparison to a derby fishery), demand for crew labor will likely fall at first. However, they note that as the fishery restructures, there may be new needs for labor not present before rationalization. They note that in virtually all IFQ fisheries, raw product quality became more important than it was prior to rationalization, leading to new skill requirements for handling and partial processing. Switching to new gear types (such as longlining instead of trawling) may also impact the need for crew labor.

Captain and crew in the non-whiting trawl fishery

Fleet consolidation, in general, means that fewer captain and crewmember jobs will be necessary. Based on the fleet consolidation analysis, the number of non-whiting trawl vessels may be 40 – 60 after the fleet is rationalized compared to a status quo number of 100 – 120. According to industry representatives, the number of crewmembers currently on west coast non-whiting trawl vessels is approximately two crew with one captain. Historically, the larger vessels had up to three or four crew (Liepzig, personal communication). The following table outlines an order of magnitude estimate of number of crew under a rationalized fishery compared to status quo based on this information.

Table 4-21. Order of magnitude estimates of the number of captain and crew jobs in the non-whiting trawl fishery.

	Number of Vessels	Approximate Number of Captain and Crew
Status Quo	100 - 120	300 – 360
Rationalized Non-Whiting Fleet (low fleet size)	~40	~120
Rationalized Non-Whiting Fleet (high fleet size)	~60	~180

Based on the analysis in Appendix C which illustrates how target species catch could be expected to increase as a result of bycatch avoidance, overall revenues in the fleet may increase by approximately 40 – 65 percent, and average catch per boat is expected to nearly triple as a result of fleet consolidation. This information suggests that any decrease in shares paid to crewmembers may be substantially outweighed by increases in revenue and catch per vessel as a result of rationalization. Increases in crew wages will likely be complimented by an increase in working hours. This increase in working hours is likely to mean that hired captain and crewmember jobs may become full time occupations.

Based on information from industry representatives, the type of crew compensation system varies somewhat across vessels. Many vessels compensate crew after calculating an adjusted gross revenue value which takes into account the cost of fees (Oregon Trawl Commission and Fishermen's Marketing Association), the cost of fuel, and cost of groceries. The share paid to crew can vary from 8 percent of adjusted gross to 12 percent of adjusted gross, with exceptional crew fetching up to 15 percent of adjusted gross. Hired captains are also paid according to the adjusted gross revenue scale, but fetch higher shares. Captains may receive 17 to 25 percent {Leipzig, personal communication}. The following table illustrates information received from industry representatives which can be used to generate order of magnitude estimates regarding crew wages under status quo conditions and under rationalized fishery conditions. This information shows that the cost of fuel under current conditions may range from 30 to 40 percent of gross, the cost of FMA fees is 1.3 percent of gross, and the cost of OTC fees is 0.5 percent of gross, meaning adjusted gross revenues may be 68.2 to 58.2 of actual gross (before subtracting groceries, for which no information was readily available). Crew shares range from 8 to 15 percent of adjusted gross, and hired captain shares may range from 17 to 25 percent of gross.

Table 4-22. Select itemized costs incurred by trawl vessel owners

	Low	High
Fuel	30%	40%
FMA	1.30%	1.30%
OTC	0.50%	0.50%
100% minus subtotal	68.2%	58.2%
Crew	8%	15%
Captain	17%	25%

Source: Leipzig, Pete. 2008. Executive Director - Fishermen's Marketing Association. Personal Communication

By assuming two crewmembers and one captain, the information shown above indicates the total share of unadjusted gross revenue received by captain and crew may range from approximately 20 percent to almost 40 percent. Captain and crew may receive 20 percent of unadjusted gross if the vessel incurs high fuel cost, but pays relatively low shares. Captain and crew may receive nearly 40 percent of gross if the vessel incurs low fuel cost, but pays relatively high shares.

Under rationalized fishery conditions the shares paid to captain and crew may decline. Assuming shares decline by 2.5 percent under rationalized fishery conditions, we can illustrate changes in overall compensation to captain and crew. This reduction is based on estimates from British Columbia which illustrate a 5 percent aggregate reduction in crew wages[27]. The following table shows the average revenue per boat based on the fleet consolidation model described in Appendix C. This analysis shows the effect of a rationalized fishery with no change in landings, and a rationalized fishery with an optimistic change in the bycatch rate leading to increases in the catch of currently under-utilized target species (described in more detail in Appendix C). Results indicate that crew wages should more than double even though the actual share may decline.

Table 4-23. Estimated compensation to hired captain and crew in the non-whiting trawl fishery

State	Avg Gross Rev/Boat	Total Captain and Crew Share (sum of all captain and crew per vessel)	Total Captain and Crew Wages (sum of all captain and crew per vessel)
Status Quo	$196,500	20% to 40%	$39,300 to $78,600
Rationalized Fishery (no reduction in bycatch rate)	$575,000	15% to 35%	$86,250 to $201,250
Rationalized Fishery (high reduction in bycatch rate)	$670,000	15% to 35%	$100,500 to $234,500

Captain and crew in the shoreside and mothership whiting fishery

Crew size in the whiting fishery is likely to follow a similar pattern. Although fleet consolidation in the whiting fishery is not expected to occur to the same degree, some consolidation is expected. Based on the analysis of whiting fishery fleet consolidation in the section describing impacts to harvesters, the number of shoreside whiting vessels may decrease from approximately 37 vessels to approximately 23 vessels, while the number of mothership catcher vessels may decline from 20 to approximately 14

[27] A 2.5 percent reduction with 2 crew equals a 5 percent reduction

vessels. This means that the number of captain and crew jobs may decline from approximately 111 to 69 in the shoreside whiting fishery, and from 60 to 42 in the mothership sector. The following table shows the approximate number of crew under the status quo fishery size and compares that to the number of crew under a rationalized fishery condition. These figures assume the Pacific whiting OY is similar to 2006 and 2007 levels.

Table 4-24. Order of magnitude estimates of the number of captain and crew jobs in the shoreside and mothership whiting trawl fishery.

Sector	Approximate Number of Captain and Crew under Status quo	Approximate Number of Captain and Crew under a Rationalized Fishery
Shoreside Whiting	111	69
Mothership Whiting	60	42

The amount of exvessel revenue attributed to the average vessel in both the mothership and shoreside sectors is expected to increase due to fleet consolidation. Using 2007 exvessel price as an indicator, the average shoreside whiting vessel may generate slightly over $430,000 per year. After fleet consolidation takes place, the average vessel may generate approximately $700,000. These figures assume whiting OYs that are similar to those set in 2007. These will undoubtedly vary, making the revenue per vessel estimates vary in concert. In the mothership sector a similar pattern may hold. Under status quo conditions the average vessel may generate over $460,000, while under a rationalized fishery with fleet consolidation, the average vessel may generate over $650,000. Such changes in the amount of revenue generated by each vessel should change the compensation paid to hired captain and crew members. Assuming the adjusted gross revenue and crew share structure described in the non-whiting fishery is similar to the whiting fishery, then crew wages in the shoreside sector may increase by over 60 percent even though the actual share declines. Crew wages in the mothership sector may increase by over 40 percent.

Table 4-25. Estimated compensation to hired captain and crew in the shoreside and mothership whiting trawl fishery.

Sector	Status Quo Captain and Crew Wages	Rationalized Fishery Captain and Crew Wages
Shoreside Whiting	$69,000 – $161,000	$97,500 – $227,500
Mothership Whiting	$64,500 – $150,000	$105,000 – $245,000

Ability to become new owners of quota

Hired captain and crewmembers are likely to be the main source of new entry into the fishery. New entry in this case is defined as new owners of quota that were not initial recipients, but subsequently purchase quota. These individuals may purchase quota but continue to be hired captain and crewmembers and fish their quota on the same vessel, or they may elect to purchase quota and a vessel and fish their quota independently.

Entering the fishery may very well prove to be more costly under a rationalized program than under status quo. In addition, entering into a fishery rationalized through a cooperative system may prove to be more difficult than entering into a fishery rationalized through a system of IFQs. Entering into a cooperative based fishery may be more difficult because catch history in a cooperative system is not divisible, meaning the cost of entry is likely to be large. The fact that IFQ is divisible makes the cost of becoming an owner of quota a lesser feat as one can purchase small quantities of quota share at a time.

The cost of purchasing quota is largely determined by the revenue above cost that is attributed to harvesting. Based on the fleet consolidation and cost efficiency model, the amount of revenue generated above costs may average $0.43 per pound for DTS species, and $0.26 per pound for non-DTS species. These estimates reflect the cost of leasing quota pounds for a single year. Purchasing quota shares is a longer term perspective, but is a function of the annual lease price. The price of quota shares is theoretically equal to the discounted value of the annual lease price. While fishermen's discount rate in this case is not known, the per pound value of quota shares can be calculated with an assumed discount rate. If we assume the discount rate is 20 percent (which is a value that falls within the range suggested by available literature), and estimate the current value of a perpetual series, then the value of DTS quota share on a per pound equivalent may be $2.15, while the value of non-DTS quota share on a per pound equivalent may be $1.30. Put in other terms, the cost of purchasing DTS quota share that is equal to 100,000 lbs may be $215,000, while the cost of purchasing non-DTS quota share that is equal to 100,000 lbs may be $130,000. However, these values are sensitive to the personal discount rate exhibited by fishermen which is not known. Whatever the discount rate may be, this information shows that entering into the fishery by purchasing quota share may prove costly. If a loan is taken out to pay for purchased quota share, then it will take several years to pay off that loan.

Captain and crew safety

The safety of captain and crew conditions is likely to change as a result of rationalization as well. Captain and crew conditions are a function of vessel safety conditions as described under the section describing impacts to harvesters. As described in that section, rationalization is expected to improve vessel maintenance because of increased profitability. Such improvements in maintenance should be expected to improve conditions for captain and crew by reducing the probability of such things as equipment failures. In addition, implementing a rationalization program on the whiting fishery is expected to reduce the Olympic conditions that exist and this fishery and should lead to less time spent fishing during hazardous weather conditions.

4.9 Non-Trawl Commercial Harvesters

In this section we describe the effects of trawl rationalization on non-trawl commercial harvesters. This group is comprised of harvesters that target groundfish and non-groundfish species with non-groundfish trawl, or non-trawl gear. In one case, (the California halibut fishery) such harvesters may use gear that is described as groundfish trawl gear, but in other cases these harvesters do not use gear described as a groundfish trawl gear. Examples include harvesters in the nearshore rockfish fixed gear fishery, the Dungeness crab fishery, and the pink shrimp trawl fishery. In many cases, trawl harvesters also participate in these other fisheries, but the focus of this section is on the impacts to those harvesters that do not also participate in the limited entry trawl fishery.

We begin this section by briefly outlining the expected effects of rationalization on non-trawl harvesters. This initial section describes the potential effects of trawl rationalization on this group of harvesters and the reasons why those effects are expected to occur. We follow this initial section with a description of the broad level effects expected to occur on non-trawl harvesters which is similar to the same sections found under the effects to harvesters and processors. The analysis of this group of stakeholders is predominately limited to this discussion of broad-level effects because there do not appear to be any distinguishable effects as a result of the analytical scenarios specifically. However, there are considerations which may have an effect on non-trawl harvesters, and these considerations are identified and discussed.

4.9.1 Methods for Assessing Impacts

In this section we describe the methodology for assessing the impacts of rationalization on non-trawl harvesters. This section summarizes the potential impacts, the reasons why those impacts occur (the mechanisms), and the way in which those impacts are analyzed and modeled (the metrics). Table 4-26 provides an overview of the approach used to estimate the impacts of the alternatives on non-trawl harvesters. The analytical approach includes 1) potential impacts; 2) mechanisms that relate the proposed action to the potential impacts; 3) measurement criteria or indicators used in assessing each type of impact; and 4) models and data sets used in the analysis.

While non-trawl vessels, and their owners and crew, would not be directly affected by the rationalization of the trawl sector, they may be indirectly affected. Possible indirect effects are the economic impacts of spillovers resulting from the rationalization of the trawl fishery. 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. In addition, the increased harvest timing flexibility afforded by rationalization may mean that trawl vessels participate in non-trawl fisheries to a greater degree than they do now. 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. Harvest for existing fishers could decline due to crowding and intensified fishing pressure on stocks. Moreover, an increase in fishery participants would result in greater market competition. These changes in economic performance could, in turn, affect the participation levels and fishing patterns of non-trawl vessels. Finally, a type of spillover could occur that is based on changes in catch in the trawl fishery of non-target species. If changes in the bycatch of Pacific halibut occur in the trawl fishery, this could increase or decrease the amount of fishing opportunity that directed Pacific halibut fishers have. Since Pacific halibut is managed to a fixed allowable catch level, an increase in trawl induced mortality would decrease the amount available to other sectors.

Another potential indirect effect can occur if non-trawl harvesters rely on the presence of a trawl sector in particular communities. Trawl vessels are often the source of much economic activity as a result of the large volume of landings. Such activity tends to draw support business and processing activity to areas where trawl vessels are found. If trawlers leave a port (see the geographic comparative advantage analysis in Appendix C), their departure may mean the departure of support business and processing activity. Non-trawl harvesters reliant on the presence of these entities may suffer as a result.

Table 4-26. Overview of impacts, mechanisms, and metrics used to compare the effect of the no action alternative and the analytical scenarios on non-trawl harvesters.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods used for Assessing Impacts
Changes in profits and participation of non-trawl commercial harvesters	Potential impacts on exvessel prices from increased fixed gear catch as a result of gear switching	Price changes of select groundfish as a result of increased quantities of fixed gear harvest	Available literature, together with expert opinion and other pertinent information
	Potential spillovers from trawl harvester participation in other fisheries, potential spillover from increased catch of non-target species, and competition over grounds and fishery resources	Changes in trawl vessel effort and catch in non-trawl fisheries and impacts to opportunities for non-trawl harvesters	
	Access to processors and markets	Reliance of non-trawl harvesters on the presence and activity generated by trawl harvesters	

4.9.2 Effects of Rationalization on Non–Trawl Harvesters

Non-trawl harvesters may be indirectly affected by trawl rationalization. The type and degree of these effects may very well be fishery specific, but to some extent the motivations driving these potential effects are the same. Potential impacts exist because of the potential for spill-over effects from trawl vessels that are removed from the trawl fishery because of fleet consolidation, spill-over effects that occur because trawl vessels have more flexibility and can remain engaged in non-trawl sectors for a longer time than under status quo conditions, spill-over of the kind that alters the available catch of certain species to non-trawl sectors because of changes in trawl fishery bycatch, and because of potential impacts to exvessel prices received for fixed-gear caught groundfish if trawl vessels switch to fixed gear to harvest IFQ fish. One additional factor of rationalization that may cause a spill-over type of effect is the aspect of gear switching that is an existing part of the rationalization alternatives. Gear switching allows vessels that currently use trawl gear to access other species. This is because trawl gear is not productive at catching species that reside in rocky habitat (though trawlers could access these species if footrope restrictions were relaxed). Depending on the allocation made to trawl and non-trawl sectors, this gear switching may allow trawl vessels to increase the take of species like nearshore rockfish. The potential for this effect to occur is not entirely known until specific management measures and allocations are identified.

In addition to spill over effects, if non-trawl sectors rely on the presence of trawl harvesters to maintain the presence of processors and support businesses, the departure of trawl vessels from a port may have geographic consequences to non-trawl harvesters. Using the regional comparative advantage analysis as a guide, if non-trawl harvesters do indeed rely on the presence of a trawl sector to maintain support business and infrastructure, then non-trawl harvesters in the ports of Crescent city, Neah Bay, Fort Bragg, and Half Moon Bay may face difficulties accessing markets and finding necessary support businesses.

4.9.2.1 *Spill-Over*

Trawl vessels participate in several different fisheries under status quo. The two most common fisheries, outside the trawl fishery, are the Dungeness crab fishery and the pink shrimp fishery. Under rationalized fishery conditions, those holding quota share have a greater expectation and control over the future of their fishing opportunity than under status quo conditions. This relaxes the need for trawl harvesters to diversify into other fisheries (like they do under status quo conditions) because they have more certainty about the future of trawling. In addition, participation in multiple fisheries will tend to inhibit the ability to specialize, and such lack of specialization may create cost inefficiencies. This means that rationalization may actually result in several trawl harvesters participating to a less degree in Dungeness crab and pink shrimp fisheries than under status quo conditions. However, the aspect of fleet consolidation may tend to work in the opposite direction as such fleet consolidation will make additional, relatively large vessels available. Vessels that are removed from the trawl fishery may very likely increase their participation in fisheries like Dungeness crab and pink shrimp. Although effort controls (limited entry and pot limits) are in place on these fisheries, there are many latent permits that exist, creating the ability for increased participation levels over status quo conditions. Another potential effect is the likelihood of consolidated trawl vessels replacing vessels that currently exist in the Dungeness crab and pink shrimp fisheries. Replacement of existing vessels may change the harvesting power of some existing non-trawl harvesters.

4.9.2.2 *Bycatch of Non-Target Species as a Form of Spill-Over*

Bycatch of non-target species in the trawl fishery can impact opportunities for other sectors that target those species. This effect can be called a type of spill-over. Pacific halibut is one example of a species that is encountered, but not targeted by trawlers. It is, however, targeted by commercial fixed gear harvesters and by recreational harvesters. Pacific halibut bycatch in the trawl fishery may change as the fishery becomes rationalized. Some have hypothesized that Pacific halibut bycatch could increase as trawlers find more efficient ways to avoid overfished stocks and access more target species such as arrowtooth flounder and Dover sole. Both of these species have been shown to be correlated with Pacific halibut, and therefore, some rationale exists for expecting that the bycatch of Pacific halibut may increase in concert. Others have countered that rationalization typically results in a wholesale reduction in bycatch because fishers no longer feel the need to compete and can spend the time fishing more cleanly. This occurs because catching non-target species and discarding them is time consuming and therefore costly, and under a rationalization program harvesters have a greater ability to avoid such species in the first place because they are not “racing” and competing among one another for catch.

Since the non-whiting trawl fishery does not currently operate as a derby with harvesters racing for catch, it may be likely that the effect rationalization has on reducing non-target bycatch not covered with IFQ will be minimal. If non-target species bycatch is covered with IFQ, there are reasons to expect bycatch of these species to decline. The British Columbia trawl fishery serves as one empirical example of Pacific halibut bycatch in a rationalized trawl fishery. At the outset of the trawl IFQ program, Pacific halibut was not managed at the individual vessel level, but was managed at a sector level. The result was that management targets set for Pacific halibut in the trawl fishery were not met. In an attempt at reaching those goals, management imposed individual vessel limits on the catch of Pacific halibut. Since that time the trawl fishery has caught less than the management target for the trawl sector as a whole (Brian Mose, 2008. Personal communication). The implication of this information suggests that covering Pacific halibut with IFQ will tend to decrease bycatch from current levels. It is not clear whether not covering Pacific halibut with IFQ will change bycatch from existing levels.

4.9.2.3 *Resource, Grounds, and Market Competition*

Other non-trawl harvesters may see indirect effects because of resource and grounds competition. Specifically, non-trawl groundfish harvesters may be affected because of the gear switching provisions that exist in the rationalization alternatives and the fact that the utilization of non-trawl gear to catch groundfish creates different opportunities in terms of markets and areas. Trawl gear is subject to regulations that restrict the maximum size of the footrope. This footrope restriction limits the ability for trawl vessels to access areas of relatively high relief substrate where many types of rockfish are found. If trawl IFQ holders are able to use non-trawl gear, this may enable those harvesters to access species such as nearshore rockfish, black rockfish, and cabezon, potentially competing with existing harvesters of those species. However, the ability for trawl IFQ holders to engage in these activities depends on the management measures in place that allow or discourage the targeting of those species and the allocation made to the trawl sector. If allocations made to the trawl sector reflect status quo harvest amounts of these species, resource and grounds competition for harvesters engaged in nearshore species (such as nearshore rockfish) are not likely to occur. If allocations to the trawl sector are increased over status quo amounts, and regulations allow targeting to occur by trawl IFQ holders, competition over grounds and resources may in fact occur.

Non-trawl harvesters that prosecute species such as sablefish and thornyheads are more likely to see grounds competition than those non-trawl harvesters that target black rockfish and nearshore groundfish species. In addition, the possibility of market competition exists in cases where a change in the quantities of fish caught with fixed gear and trawl gear can have an effect on exvessel price. One species likely to be the cause of gear switching made by IFQ holders is sablefish. As illustrated previously, the price paid for fixed gear caught sablefish is noticeably higher than the price received for trawl caught sablefish. Because of this price differential, trawl vessels are likely to use non-trawl gear to some degree to harvest sablefish.

Several have hypothesized that an increase in the amount of sablefish harvested with fixed gear would drive prices down for fixed gear caught sablefish from their current levels, thus negatively impacting existing fixed gear sablefish harvesters. Whether or not this is likely to be the case depends on several factors including the amount of sablefish harvested on a global market and whether sablefish caught on the west coast competes in the same, global market or is directed to a separate market. If the amount of sablefish caught on the west coast is small relative to the amount caught globally, and west coast sablefish competes in the same market as sablefish caught in Alaska and British Columbia for example, then there is not likely to be a price effect if trawl vessels switch to fixed gear.

To help determine whether a price effect is likely, we compare west coast sablefish landings with landings made in Alaska and British Columbia during 2006. This information shows that in 2006, landings from the west coast made up 25 percent of landings from the three areas. The amount potentially subject to gear switching (the trawl allocation portion) represents 11 percent. It is unlikely that this entire amount would be caught with fixed gear, simply because some must be held in order to serve as incidental catch while targeting other, associated target species like Dover sole.

	Alaska 2006 Landings	**British Columbia 2006 Landings**	**W-O-C 2006 Landings**	**2006 West Coast Trawl Allocation (a portion of W-O-C)**	**Total 2006**
Actual mt	15,199.5	4,535	6,472	2,971	26,206
Percent of total	58%	17%	25%	11%	100%

Source: NOAA Fisheries. 2008. Office of Science and Technology. Catch Statistics
NOAA Fisheries – Northwest Fisheries Science Center. 2008. 2006 Groundfish Catch Estimates
Canadian Department of Fisheries and Oceans. 2008. Pacific Region. Regional Data Services Unit. Summary Commercial Statistics

Unfortunately data does not readily exist which would help inform whether or not west coast sablefish is sold in a different market than sablefish caught in other regions. However, it is known that Japan is the largest consumer of U.S. exported sablefish. Japan purchased 90 percent of U.S. exported sablefish in 2002, and 73 percent of U.S. exported sablefish in 2005 {Alaska Seafood Marketing Bulletin, January 2006}. The Japanese market has been shown to be somewhat elastic, where changes in supply have noticeable changes in price. Huppert and Best show that as per capita imports of sablefish increased, the import price decreased{Huppert and Best, 2004}. Specifically, as per capita imports double, the import price in Japan declined by 30 – 40 percent.

Given the large amount of sablefish purchased by Japan, it appears unlikely that fixed gear caught sablefish on the west coast is sold in a different market altogether than fixed gear caught sablefish from other regions. Though there may be some local markets that purchase west coast sablefish specifically, it seems unlikely that all, or even the majority, of west coast sablefish is purchased by these local markets. It may be reasonable to expect, however, that there are different markets for fixed gear and trawl caught sablefish, simply because of the relative quality of fish caught by both methods. If that is indeed the case, and Japan is the buyer of most fixed gear sablefish, the change in supply of fixed gear caught sablefish as a result of gear switching may have a slight effect on the import price paid in the Japan market. Such a change may, in turn, have a slight downward influence on the exvessel price received by harvesters. However, given the amount of sablefish potentially subject to gear switching, such a price effect is likely to be small. For example, using the information found in Huppert and Best, if 10 to 20 percent of the trawl allocation is caught with fixed gear, this will have less than a 1 percent downward price effect on the Japanese import price of sablefish.

Non-trawl harvesters that currently target sablefish may see grounds competition if trawl vessels switch to fixed gear. Trawl vessels that switch to fixed gear for example may join fixed gear harvesters of sablefish in their same fishing grounds, thus leading to competition for space. In addition, as trawl harvesters switch to a new gear there may be a learning curve which leads to more adverse interaction with existing fixed gear harvesters (because of the potential for tangled and poorly set gear) in the years immediately following rationalization. In addition, if gear switching leads to an increase in the amount of fixed gear used, this may increase conflicts with trawl vessels as trawl vessels search for grounds. Such conflicts are likely to result in a loss of fixed gear if trawlers inadvertently tow through sets of pot or longline gear.

One factor interacting with the gear switching provisions are the RCAs established for trawl and fixed gear vessels. If the seaward boundary of the RCA remains more restrictive for vessels harvesting trawl IFQ fish (either with fixed gear or with trawl gear) this may reduce the impact on existing non-trawl harvesters of sablefish since there would be less competition for those grounds between the fixed gear and trawl RCA. However, those trawl vessels using fixed gear may have gear conflict with trawl gear. Therefore, if differential RCAs remain in place that are just gear specific, trawl IFQ holders that use fixed gear may avoid some interactions with trawl gear, but may have interactions with existing fixed gear harvesters.

4.10 Shoreside Processors of Trawl Groundfish

Trawl rationalization may result in a wide range of impacts on processors, varying in extent and degree depending upon analytical scenario. As a result of rationalization, it is likely that impacts to processing businesses will be distributed according to the geographic shift of fishing effort and subsequent consolidation of fishing and processing enterprises. Impacts may also occur based on the extent to which processing companies gain and control quota shares. The types of impacts and associated mechanisms relating to the trawl IFQ program on processors are outlined in more detail below.

In this section, we describe the impacts of rationalization on shoreside or land-based processors of trawl-caught groundfish. This group is composed of businesses that receive whiting and non-whiting groundfish directly from harvesters, conduct processing activities on the fish in order to make product forms that are usable at the wholesale and/or retail market level. In several cases, entities holding limited entry trawl permits may be processors of limited entry trawl caught groundfish. Such entities are included among those examined in this section.

The section begins with a description of methods used to assess effects on processors and the metrics used to illustrate those effects. The variables and metrics used, some of which are also used in earlier sections, can be compared and contrasted among the analytical scenarios. The broad-level effects of rationalization on groundfish processors are presented next, and contains a discussion of important general issues associated with rationalizing the fishery.

Following the description of broad-level effects, we assess the impacts on processors of the analytical scenarios. This section begins by identifying the impacts that are expected to occur from each of the elements of the scenarios independently. We then provide an assessment of each analytical scenario on groundfish processors. This assessment is designed to be fairly programmatic in nature and examines the ways in which processors of trawl-caught groundfish are affected by the combined suite of options that exist within each scenario. At the end of this section we provide a comparative summary that is intended to be a side-by-side comparison of the effects of each analytical scenario on groundfish trawl harvesters.

Finally, we assess cumulative effects of rationalization on processors. This cumulative effects section briefly summarizes the past and present actions with ongoing effects on shoreside processors of trawl-caught groundfish, and the reasonably foreseeable future actions that are anticipated to have effects. The combined effect of these past, present, and reasonably foreseeable future actions are merged with the effect of the analytical scenarios to arrive at the cumulative effect.

4.10.1 Methods for Assessing Impacts

The section contains a brief overview of the methodology we used for assessing the impact of rationalization on processors, including the ways in which each of the expected impacts is measured and assessed. A summary is included of the potential impacts described above, the reasons why those impacts occur (the mechanisms), and the way in which those impacts are measured (the metrics). Table 4-27 provides an overview of the approach used to estimate the impacts of the alternatives on processors of trawl groundfish, in a format similar to previous analytical categories: 1) potential impacts, 2) mechanisms that relate the proposed action to the potential impacts; 3) measurement criteria or indicators used in assessing each type of impact; and 4) models and data sets used in the analysis. The potential impacts to processors are changes in economic performance, or profitability, of individual processors, and changes in economic efficiency of the processing sector as a whole. Changes are initiated by at least eleven identifiable mechanisms; these are described in some detail in Appendix C, along with the methods anticipated for examining the impacts.

Table 4-27. Overview of impacts, mechanisms, and metrics used to compare the effect of the no action alternative and the analytical scenarios on processors of trawl caught groundfish.

Potential Impacts	Mechanisms Driving Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data and Models used for Assessing Impacts
Changes in processor net revenue	Changes in the bargaining power between harvesters and processors	Exvessel and wholesale prices	Qualitative economic assessment of negotiation outcomes
	Regional shifts in landings patterns	Location and quantity of landings	Regional comparative advantage model
	Initial distribution of IQ	• Processor ownership of harvest privileges • Location of harvest privileges	The effect of initial distribution of IQ
	Changes in the quantity and mix of landings	Quantity and type of groundfish landings	Change in bycatch, landings and revenue
	Changes in the timing of harvests	Seasonality of groundfish landings	• Seasonality of harvest information from CP sector • Geographic shifts in fishing patterns
	Barriers to entry into the processing sector	New entrants to processing sector	Qualitative assessment based on expertise of analysts
	Market restructuring	Number of processing companies and the amount of vertical and horizontal integration	Qualitative assessment based on literature review and expertise of analysts
	Change in the quality of landings	Quality of trawl groundfish landings	Qualitative assessment based on expertise of analysts
	Change in processor costs	Changes in the cost of labor and other costs	Qualitative assessment base on expertise of analysts
	Product recovery and yield	Product recovery	Literature review on product yields and changes that occur as a result of rationalization
	Long term business planning	Ownership of quota share	Qualitative assessment based on whether processors own quota share
	Product output mix	Seafood products produced by trawl groundfish	Qualitative assessment based on expertise of analysts

The mechanisms that are driving changes in processor net revenue include the changes in relative bargaining power between processors and harvesters over exvessel prices; regional shifts in landing patterns; initial allocation of QS; changes in the quantity, quality, and timing of harvests; barriers to entry into processing and sector restructuring; and changes in processor costs, product yield, and output mix. Each of these mechanisms that are drivers for the potential impacts are measured through listed criteria (third column) which are estimated through the methods described in final column. The model-based methods are described in Appendix C and earlier sections of Chapter 4.

4.10.1.1 *Information Collection*

Several categories of information were collected on processors in order to more adequately assess the impacts of rationalization on processors and to characterize the existing state of the West Coast processing industry. These information collection exercises included:

- The existing location of trawl groundfish processing plants and their source ports. Information is available showing where buyers of trawl groundfish are located, but there have previously been limited attempts to characterize where those fish are actually processed. This exercise identified a representative set of information identifying the location of trawl processing plants and the ports from which those plants receive their fish.

- Company ownership information. This information was developed to show which companies own which processing plants. This is useful for documenting the existing number of companies and to determine the impact to processors at the company level instead of just the plant level.

- Lessons learned. Using information developed during the early stages of the project, as well as information gathered specifically for this exercise, lessons learned from other domestic and foreign IQ programs are discussed in terms of their relevance to West Coast processors

4.10.1.2 *Potential Impacts, Mechanisms, and Metrics*

Bargaining Power: There is a negotiating relationship that exists between processors and harvesters with respect to exvessel prices. The alternatives would result in, at one extreme, 100 percent of shares to permit owners. In this scenario, processors believe they will be at a relative disadvantage in setting ex-vessel prices, and that the capacity of the processing sector may no longer match the rationalized fishery, in which seasons may be elongated. At the other extreme, issuing fishing QS for processors would, it is argued, guarantee that certain processors would have access to product, above and beyond the QS they may also receive as permit owners. This increased access to product could reduce a processor's need to compete in the marketplace for an independent harvester's fish. It is argued that this scenario may lower the exvessel price received by harvesters.

The relative shift in bargaining power for processors is assessed qualitatively. A review of the game theory and negotiation literature is made with particular emphasis on applications to fisheries or similar common property situations. The experience of other fisheries is also examined for any conditions that may be applicable.

Regional Shifts in Landings: Trawl rationalization is anticipated to result in geographic changes in harvest patterns in the non-whiting trawl fishery, and consequently, increases or decreases in the amount of landings at West Coast ports. These changes are likely to impact processor operations. To examine this impact, the geographic shift and regional comparative advantage analysis is used to show regions likely to experience change. The output of this analysis was applied to a representation of the web of physical processing plants, ownership, and their regional buying stations.

Initial Distribution of IQ: The manner in which IQ is initially distributed will have a profound effect on the processing sector, especially if processors receive designated QS. The analysis of the initial distribution originates from two models: 1) a quantitative analysis of initial shares based on historic landings, and 2) a delineation of processor ownership combined with historic purchases of landed trawl-caught groundfish. Applying the distribution rules for each of the alternatives on the two models will yield output that can demonstrate the patterns of initial IQ.

Changes in Quantity and Mix of Catch: Trawl rationalization will not only change the regional distribution of catch, but also the quantity and species mix of the catch. It is expected that the elimination of derby-style race for whiting, along with a net increase in non-whiting harvests, will allow vessel operators to have a greater ability to respond to market forces in terms of targeting species. Furthermore, harvest operations managed with individual accountability are expected to avoid bycatch to a greater extent, leveraging more under-utilized target species. These changes in quantity and mix of catch will have a direct effect on processor operations and profitability. It is also argued that, particularly if processors own QS, processors may play a greater role in arranging harvester contracts for targeting species.

The bycatch model (4.1.7.1.4), illustrating the potential to reduce the catch rate of overfished species, was used to predict changes in quantity of target species harvest. The model outputs allows for a forecast of the aggregate changes in deliveries made to processors.

Harvest Timing: The rationalization program will tend to slow the pace of derby style fisheries that exist in both the shore-based and mothership sectors of the whiting fishery. It is expected that these sectors will elongate as fishery participants no longer feel the need to compete. However, certain sideboards exist including the timing of the Bering Sea Pollock fishery and the availability of whiting to shorebased harvesters in particular. These sideboards place limits on the degree to which the season may elongate. Harvest timing will affect processors by changing or lengthening the period of harvest, and processing, changing the need and demand for labor, and changing the need and demand for processing capital. A longer season will tend to reduce peak harvest volume thereby potentially lessening the demand for processing capital. A reduction in peak-period harvest volume may also reduce the need for overtime labor during peak periods, potentially altering the cost of labor.

Market Restructuring: The processing sector is organized with a few very large operations and their subsidiaries, along with a number of smaller and mid-sized firms. In a rationalized trawl fishery, some changes in the industrial organization of processors are anticipated, based on experiences found in other rationalized fisheries, including possible consolidation, joint ventures, and other arrangements among processors (vertical integration) and between processors and harvesters (horizontal integration). In addition, there can be influences leading to changes in diversification, expansion in the use of custom harvesting and processing, and related market restructuring.

Quality of Landings: In addition to changes in harvest timing and elimination of the derby-style fishery is an improvement in the quality of landed fish. Harvesters have better opportunity to be more selective in harvests, and to manage the harvested fish once on board in such a way as to retain higher quality. The quality could also be affected if the volume of individual landings is reduced. This could lead to generally higher prices received by harvesters, and the effect on processors could be positive or negative, depending upon the processors' ability to influence wholesale or retail prices with the higher quality fish. Processors could also be positively affected if the better quality fish leads to new market opportunities. The analysis addressed these concepts qualitatively.

Processor Costs: In a rationalized fishery, the cost of processing could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if there is more uniform operation during the season or year, with fewer hires and layoffs and less overtime required. There may be an ability to better utilize capital resources and capacity to avoid idle periods, offset by times of overuse. Other costs could be affected depending upon ability to open new markets or change operations. A qualitative discussion of these items was conducted.

Product Recovery Yield: A concept related to harvest timing and quality of landings is the positive effect on product recovery yields. Reducing the derby-style fishery can lead to more careful management of the fish that are harvested and less waste. The experiences from other rationalized fisheries are explored and discussed qualitatively.

Product Output Mix: A rationalized fishery will reduce the need for shortened seasonal harvests, and allow harvesters (and processors who contract with them) to better respond to market conditions, tastes and preferences, and changing demands by consumers. In particular, the effect of rationalization may lead to new and additional products in the market, and allow specialized niche markets to develop, with an associated increase in ability to compete and profitability. A qualitative analysis was prepared, influenced by experiences in other fisheries and the existing market structure of the West Coast fishery.

4.10.2 Broad-Level Effects of Rationalization on Shoreside Processors

Broad level effects to processors from rationalization could include changes in bargaining power over exvessel prices, the quantity and quality of fish to be handled, the location of landed catch, and the timing of deliveries, among other things. The structure of the West Coast groundfish processing sector differs from that seen in other fisheries, such as the pollock fishery in the Bering Sea or the North Pacific halibut fishery, and as a result, the effects on processors from trawl rationalization may be different than that seen elsewhere after rationalization went into effect.

4.10.2.1 *Exvessel Price Negotiation*

Available information suggests that the processing sector, as buyers of raw fish, consists of few "large" firms, a few "moderate" sized firms, and a considerable number of small firms. In the non-whiting sector, three firms have processed nearly 80% of landings in recent years. The shoreside whiting sector involves fewer firms in total, but the three largest have processed over 85% of recent landings.[28] Economic literature suggests that an industry with this type of structure may operate in a manner where the largest firms appear to behave competitively, and the smaller firms respond to the exvessel prices set by the larger ones. However, in the West Coast seafood industry the final processed products enter markets where they compete with similar products originating elsewhere in the United States and other countries, and are therefore more competitive in the final processed product market. In other words, market structure suggests that West Coast processors are generally unable to influence market prices for final products.

Harvesters and processors are in a dependent relationship, each specializing in certain elements in the supply chain that brings fish to the ultimate consumer. For this reason, rationalization is likely to affect processors directly by altering this relationship. Rationalization will also have second-order effects on processors because of direct impacts to harvesters and the response of harvesters to such effects. The distribution of quota share will have a direct effect on processors by potentially altering the bargaining power between processors and harvesters over exvessel prices. Currently, the market structure indicates that non-whiting processors may have more influence over harvesting operations than the permit owners. Pacific whiting processors appear to have less influence over harvesting operations.

Assignment of quota shares to harvesters may alter existing relationships. Under status quo, harvest opportunity is ephemeral. It is either lost to other harvesters if all harvesters are fishing against a single quota (the situation in the whiting sector) or the opportunity must be exercised within a given 2-month

[28] The "historic landings" period is 2004 through 2006 for both whiting and non-whiting.

cumulative landing limit period (the situation in the nonwhiting sector). IFQs and cooperatives each institute a quasi-permanent harvest privilege assigned to the individual (or cooperating group). Even though the harvest opportunity (quota pounds) must be exercised within the year, the underlying quota share renews the specified opportunity in the next year. IFQ holders even have the ability to sell their quota pounds and realize some gain from the harvest opportunity they do not exercise. This gives harvesters much greater latitude to hold out for better prices because they have a guaranteed harvest opportunity over a longer time period. IFQ ownership by processors would tend to offset the gains for harvesters. For example, a processor could use quota shares to induce a harvester that is short of quota pounds for a particular species to make deliveries under specified conditions and prices. At this time it is unclear what balance of processor/harvester quota ownership would achieve status quo conditions.

Harvester quota shares are likely to have a second order effect on processors through several fronts. Fleet consolidation would reduce the number of harvesters, thus lessening the processors' market influence by more closely aligning the number of harvesters with the number of processors. Assignment of quota shares to processors would have a countervailing effect because, as suggested above, processors could use the quota shares they control as leverage in forging agreements with harvesters.

Exvessel prices directly influence profitability. Asset values are one factor that could potentially change under a rationalized fishery because of changes in exvessel prices. This can occur because the value of an asset is a function of the profits associated with that asset. If exvessel prices change in a fishery in favor of harvesters or in favor of processors, the value of assets associated with harvesting or with processing should be expected to change in concert. Therefore, while considering the effect on exvessel prices, it is important to consider the implications that a change in exvessel prices may have on profitability and the value of assets currently residing in the fishery.

There are a number of second order effects on processors resulting from changes in the groundfish trawl sector that would occur no matter how a trawl rationalization program is structured as part of the proposed action. These include changes in the distribution of landings across West Coast ports and over the year, the quantity and mix of catch delivered to processors, and the quality of landed catch. These broad-level effects are discussed in Section 4.xx from the harvester perspective; from the processors perspective some effects may be beneficial and others adverse.

4.10.2.2 *Regional Shifts in Landings*

As discussed in Section 4.15.5, the distribution of landings across West Coast ports may change as a result of fleet consolidation, industry agglomeration, and the comparative advantage of ports (a function of bycatch rates in the waters constituting the operational area for the port, differences in infrastructure, and other factors). Processors have invested in physical plant (processing facilities and related infrastructure) based on the historical distribution of landings. To the degree that harvesters wish to change their port of landing, and depending on the relative bargaining power discussed above, there could be a mismatch between the distribution of existing physical plant and the volume of catch landed in different ports. If processors retain a relatively large degree of bargaining power (by holding quota share), they could have influence over the location of landings by enticing or directing harvests to existing plants even if the harvesters prefer to fish in other areas. Otherwise, processors may need to enlarge operations at facilities seeing an increase in landings and reduce operations, or shut down plants, in ports where landings permanently decline. Alternatively, they could truck fish from the port of landing to their facilities. In either case, a shift in the location of landings may mean a shift in the location of where those landings are processed. We use the term "at risk" to describe processing volumes that may move to another location under a rationalized fishery. For example, landings of non-whiting trawl groundfish that historically came into Neah Bay have often been processed in Astoria, Oregon. According to the regional comparative advantage analysis, those landings historically made at Neah Bay are at a disadvantage for a variety of reasons and it may be reasonable to assume that catch would be landed elsewhere. The quantity of product processed in Astoria that originated in Neah Bay may be put "at risk" as catch historically delivered to Neah Bay gets delivered elsewhere. These landings may continue to be processed in Astoria, but not necessarily, and therefore that relationship is at risk.

Data on where landings of non-whiting groundfish were processed during the period 2004 - 2007 was compiled to illustrate the spatial relationships between processing centers and buying locations. Table 4-28 shows the cities where processing occurred, the ports where the fish came from, the distance in road miles between the port of origin and processing city (determined using Google Earth), and the percent of coastwide landings processed in that city. (Note that a processing city can also be a port of origin for that city, meaning the fish was processed locally. In those cases the road distance is zero.) It can be seen that there are a few major processing centers on the west coast. Only seven cities processed more than 1 percent of coastwide landings and the largest processing center, Astoria, Oregon, accounted for more than two-thirds of processing activity by weight of landed fish.[29] The other processing cities above 1 percent are: Newport (15 percent), Eureka (15 percent), Bellingham (12 percent), Coos Bay (9 percent) Fort Bragg (7 percent), and Watsonville (2 percent). These seven processing centers accounted for 96 percent of the coastwide total. These ports also tend to "import" fish from a larger number of ports.

Table 4-29 shows the characteristics of processing centers and related ports. (The ports are shown in geographic order, from north to south along the coast. Horizontal lines in the table indicate the three state boundaries.) For confidentiality reasons the numerical value of volumes of processed fish are not given; instead, these data were classified in quartile categories labeled none, low, medium, and high. Fish is either locally processed, meaning that the port of landing and processing location are the same city; "imported," meaning the fish is trucked in from other ports; or "exported," meaning the fish is sent from that port to another location. Ports with no local non-whiting groundfish processing, such as Blaine, Washington, or Crescent City, California, show no local processing or imports of fish. Processing cities away from the coast, such as Watsonville or Santa Rosa, California, show only imported fish since they are receiving fish from coastal ports and not being a landing site do not export fish.

Befitting its number one rank, Astoria has the second-highest number of local processors of non-whiting groundfish (Coos Bay has six) and receiving ports. It processes a high volume of locally landed fish and also imports a high volume but exports fish. The high volume of imported fish suggests that local processors are trying to optimize plant capacity, which would seem to exceed (at least periodically) the capacity of local non-whiting landings. (Plant capacity may be structured for variable whiting landings and shifted to processing other fish during off-peak periods.) It also indicates Astoria's importance as a regional processing center. The other top-ranked processing centers also show high volumes of locally processed and imported fish, but also export fish to other locations.

Figure 4–35 through Figure 4–38 visually represent the processing networks. The road routes (derived from Google Earth) are classified in quartiles by the volume of fish trucked over those distances.[30] Pie charts indicate the proportion of locally-processed, imported, and exported fish for each processing city.

[29] The Astoria figures also include those for the adjacent town of Warrenton. In a couple of other cases some processing in adjacent or nearby cities has not been aggregated, which is an oversight. For example, South Beach is adjacent to Newport, so its volume should be added to that of Newport, and Harbor is adjacent to Brookings.

[30] Routes between each port and processing city are separately mapped. Because many of these routes overlap

Figure 4–35 shows the regional dominance of Astoria in northern Oregon and Washington's Olympic Peninsula. Nearby Ilwaco/Chinook could be considered part of a regional agglomeration that can draw on sources of supply using the Columbia River estuary and a common labor pool. Bellingham is a regional center for the eastern shore of Puget Sound.

As seen in Figure 4–36, Newport is an important processing center on the central Oregon coast. Local landings account for more than half its total processing; it also imports and exports smaller volumes. Newport, South Beach and Waldport could be considered part of a regional agglomeration. Waldport imports its small volume of fish from Newport. South Beach, adjacent to Newport, imports fish from Florence. Newport exports 12 percent of its landings to Coos Bay while close to half of the fish landed in Coos Bay is exported to Newport, suggesting a further linkage between these two processing cities. Coos Bay also exports a very small proportion of its landings to Santa Rosa, some 436 road miles away. After Newport, the next-highest volume of Coos Bay imports come from Brookings; no fish is imported from California.

Eureka is a regional center for northern California; imports account for slightly less than half of the fish processed there and is derived from five other locations, from Brookings and Crescent City on the Oregon-California border to as far south as San Francisco (although the volume is small). Fort Bragg imports about a third of the fish processed there from Eureka and much smaller amounts of fish from the central California ports of San Francisco and Half Moon Bay. In fact, one-fifth of the fish landed in Eureka is exported to Fort Bragg.

As seen in Figure 4–37 and Figure 4–38, south of Fort Bragg there are many more processing locations but the amounts of non-whiting groundfish processed in these cities is generally small. In this region, only the inland city of Watsonville falls within the top seven processing locations listed above. Santa Rosa and San Francisco are important regional processing centers but handle much smaller volumes of non-whiting groundfish. The number, dispersed locations, and small volumes handled of processing locations in central California suggest that groundfish represents a small proportion of the overall activity of these processors. All the processing locations south of San Francisco, including Watsonville, account for a little under 4 percent of the coastwide total.

Table 4-28. Relationship between processing cities and ports.

Processing City	Port	Distance
Aberdeen	Westport	21
Astoria	Aberdeen	78
	Astoria	0
	Neah Bay	234
	Port Angeles	239
	Tillamook/Garibaldi	66
	Westport	86
Atascadero	Morro Bay	17
Avila	Avila	0
Bellingham Bay	Bellingham Bay	0
	Blaine	21
Bodega Bay	Bodega Bay	0
	Crescent City	224

and the way in which the line segments are mapped in some cases narrower lines (lower volume routes) may be hidden behind heavier lines (higher volume routes).

Processing City	Port	Distance
Charleston (Coos Bay)	Brookings	104
	Charleston (Coos Bay)	0
	Newport	105
	Winchester Bay	28
El Granada	Marshall	4
	Princeton / Half Moon Bay	71
	Rodeo	50
	Vallejo	60
Eureka	Bodega Bay	239
	Brookings	112
	Crescent City	85
	Eureka	0
	Fort Bragg	134
	San Francisco	272
Fort Bragg	Eureka	134
	Fort Bragg	0
	Princeton / Half Moon Bay	199
	San Francisco	172
Harbor	Brookings	3
Hawaiian Gardens	Avila	216
	Moss Landing	412
	Princeton / Half Moon Bay	359
Ilwaco/Chinook	Ilwaco/Chinook	0
Los Osos	Avila	5
Monterey	Monterey	0
	San Francisco	118
Morro Bay	Morro Bay	0
	Moss Landing	143
Moss Landing	Monterey	18
	Moss Landing	0
	Santa Cruz	25
Newport	Charleston (Coos Bay)	99
	Newport	0
	Tillamook/Garibaldi	68
Nipomo	Avila	27
Oxnard	Moss Landing	286
	San Francisco	391
Princeton / Half Moon Bay	Princeton / Half Moon Bay	0
Sacramento	San Francisco	88
San Francisco	Bodega Bay	70
	Crescent City	357
	Dillon Beach	59
	Morro Bay	232
	San Francisco	0
San Jose	Moss Landing	59
	Santa Cruz	34
San Leandro	Moss Landing	34

Processing City	Port	Distance
	Princeton / Half Moon Bay	92
Sand City	Moss Landing	15
Santa Barbara	Santa Barbara	0
Santa Cruz	Santa Cruz	0
Santa Rosa	Brookings	328
	Charleston (Coos Bay)	436
	Moss Landing	158
Scotts Valley	Princeton / Half Moon Bay	54
	Santa Cruz	7
South Beach	Florence	47
Tillamook/Garibaldi	Tillamook/Garibaldi	0
Waldport	Newport	17
Watsonville	Avila	157
	Morro Bay	147
	Moss Landing	9
	San Francisco	91

Table 4-29. Characteristics of processing centers and ports

Processing City	No. of Processors	No. of Receiving Ports*	No. Processing Cities Exported to	Local Processing	Imported Fish	Exported Fish
Blaine	0	0	1	None	None	High
Bellingham Bay	3	2	0	High	High	None
Neah Bay	0	0	1	None	None	High
Port Angeles	0	0	1	None	None	Medium
Aberdeen	1	1	0	None	Medium	None
Westport	0	0	2	None	None	High
Ilwaco/Chinook	1	1	0	High	None	None
Astoria	5	6	2	High	High	None
Tillamook/Garibaldi	2	1	2	Low	None	Medium
Newport	4	3	2	High	High	High
South Beach	1	1	0	None	Medium	None
Waldport	1	1	0	None	Low	None
Florence	0	0	1	None	None	Medium
Winchester Bay	0	0	1	None	None	Medium
Charleston (Coos Bay)	6	4	2	High	High	High
Brookings	0	0	4	None	None	High
Harbor	1	1	0	None	Low	None
Crescent City	0	0	3	None	None	High
Eureka	1	6	1	High	High	High
Fort Bragg	2	4	1	High	High	High
Santa Rosa	1	3	0	None	High	None
Bodega Bay	2	2	2	Low	Medium	Medium
Dillon Beach	0	0	1	None	None	Low
Marshall	0	0	1	None	None	Medium
Sacramento	1	1	0	None	Medium	None

Processing City	No. of Processors	No. of Receiving Ports*	No. Processing Cities Exported to	Local Processing	Imported Fish	Exported Fish
Vallejo	0	0	1	None	None	Low
Rodeo	0	0	1	None	None	Medium
San Francisco	4	5	6	High	High	High
San Leandro	1	2	0	None	Low	None
Princeton / Half Moon Bay	3	1	5	High	None	Medium
El Granada	6	4	0	None	High	None
San Jose	1	2	0	None	Medium	None
Scotts Valley	1	2	0	None	Medium	None
Santa Cruz	1	1	3	Low	None	Medium
Watsonville	2	4	0	None	High	None
Moss Landing	3	3	8	High	Low	High
Sand City	1	1	0	None	Medium	None
Monterey	1	2	1	High	Medium	Medium
Atascadero	2	1	0	None	High	None
Morro Bay	3	2	3	High	Medium	High
Avila	1	1	4	Low	None	Medium
Los Osos	1	1	0	None	Low	None
Nipomo	1	1	0	None	Low	None
Santa Barbara	3	1	0	Low	None	None
Oxnard	1	2	0	None	Medium	None
Hawaiian Gardens	1	3	0	None	Medium	None

*Including the processing city.

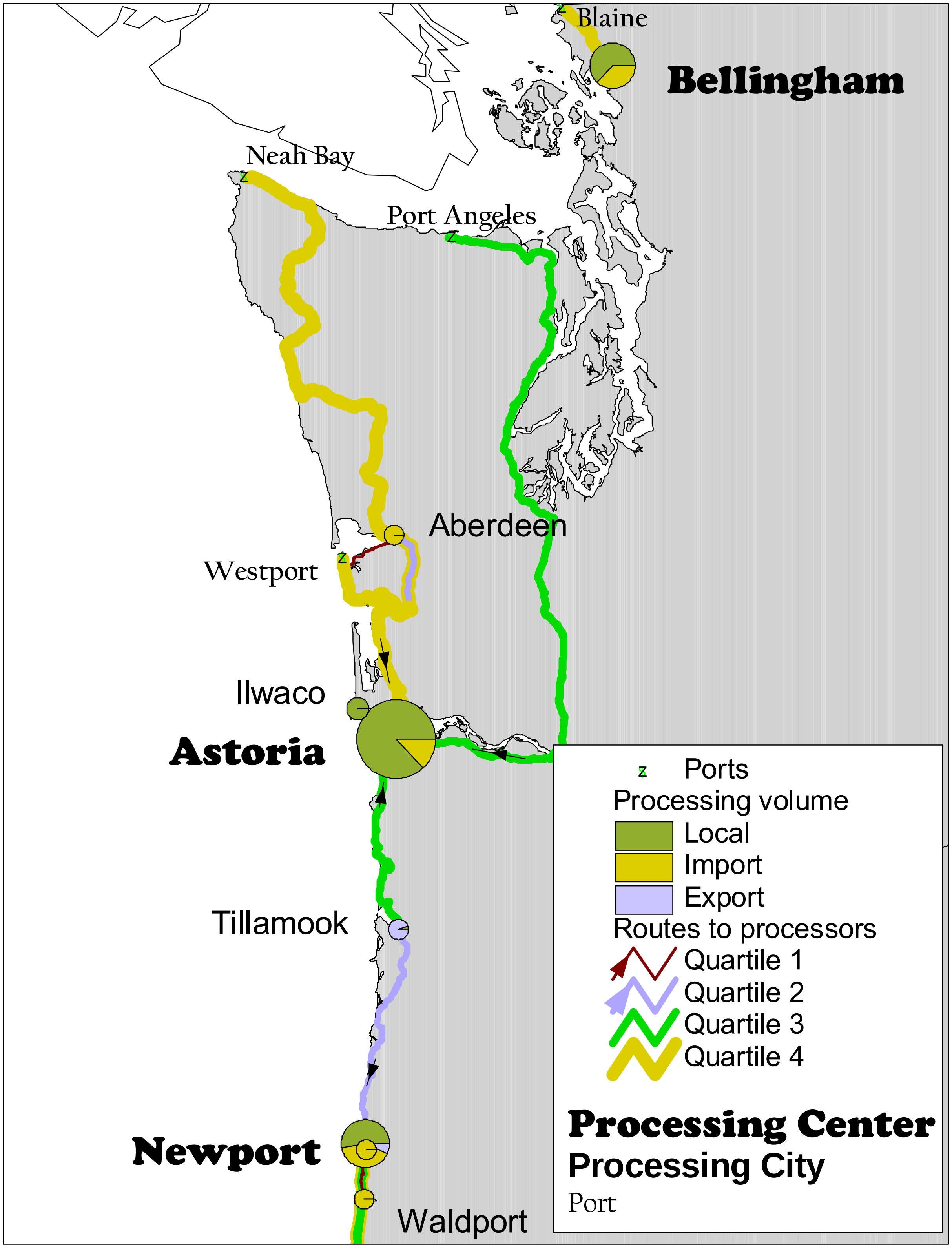


Figure 4–35. Processing relationships in Washington and northern Oregon.

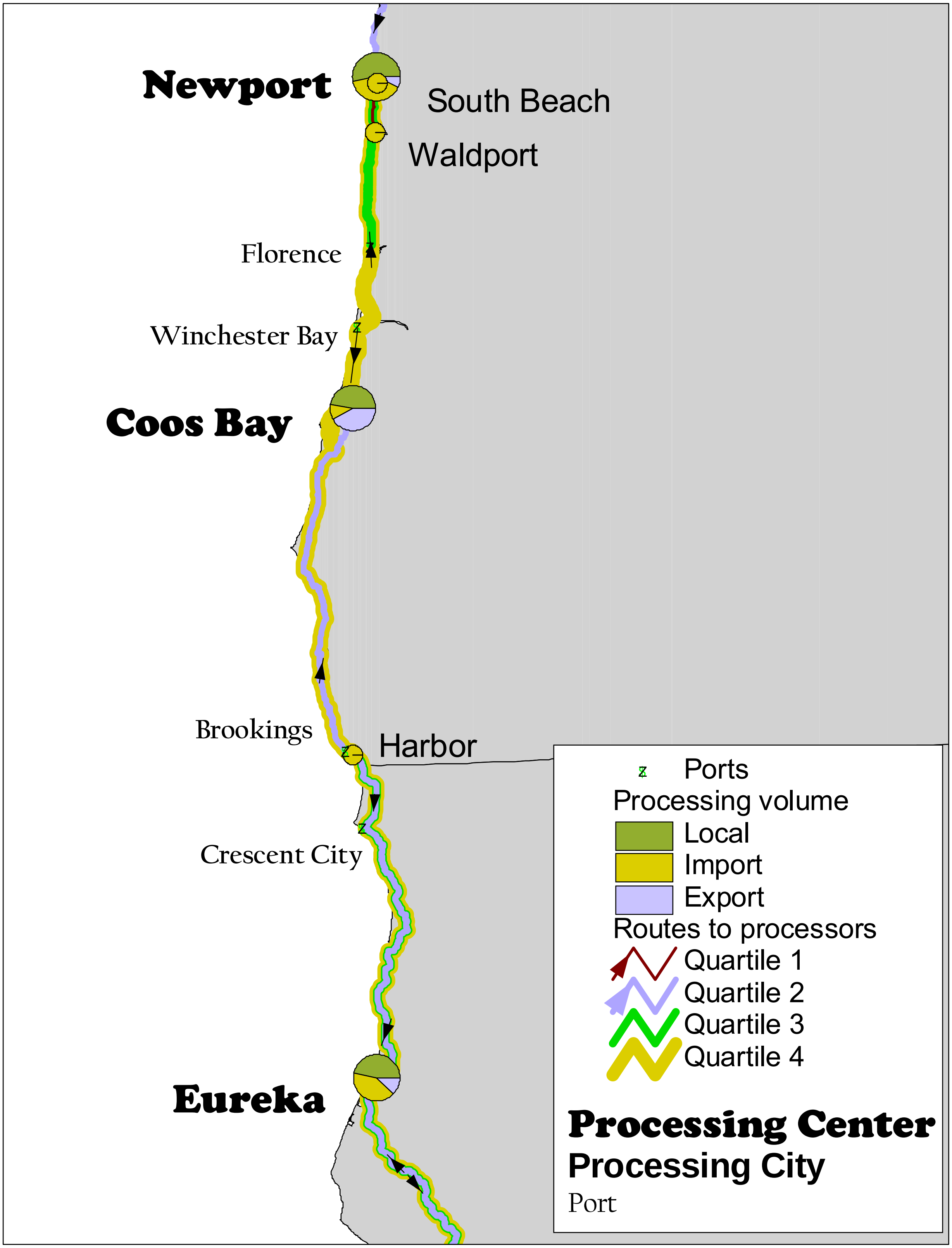


Figure 4–36. Processing relationships in Oregon and northern California

Figure 4–37. Processing relationships in northern California

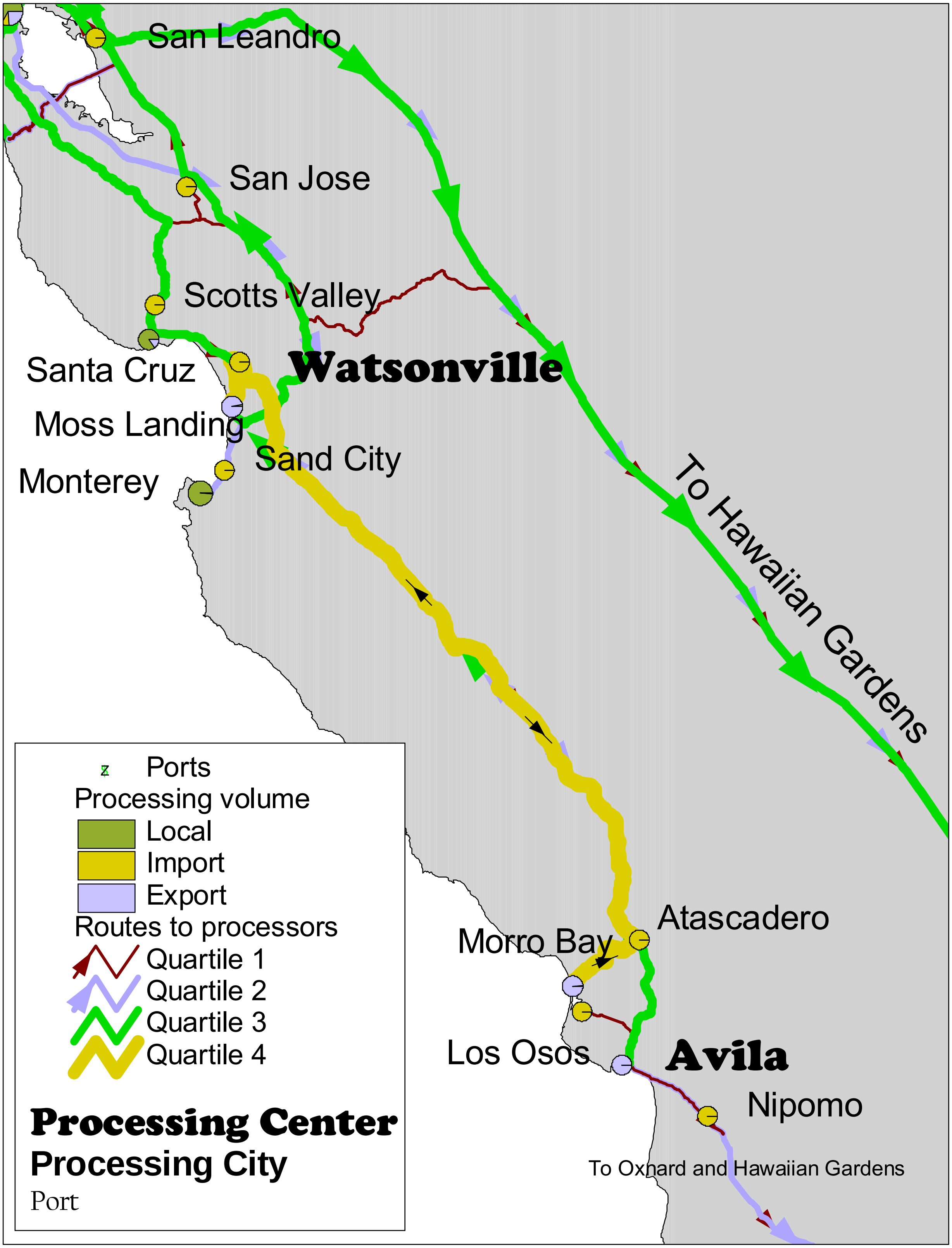


Figure 4–38. Processing relationships in central California.

The implication of this network information can be combined with the geographic comparative advantage analysis described in Appendix C. This comparative advantage analysis indicates several potential shifts in regional distribution of landings:

- Neah Bay appears to be at a clear relative disadvantage, suggesting landings may shift toward another location.
- The ports with the greatest advantage appear to be in the north, suggesting a shift in effort and catch at a much broader, aggregate level from central California, toward northern California and Oregon.

The implication of this geographic shift information suggests that processors associated with disadvantaged communities may see trawl groundfish volumes decline. Those processors receiving landings from central California may see a reduction in trawl caught groundfish if the market is able to re-direct activity toward more efficient and advantaged ports. However, gear switching may work at retaining landings in those ports because of different relative rates of bycatch, less infrastructure necessary to support (presumably smaller) fixed gear vessels, and proximity to markets that appear more favorable to non-trawl caught fish species.

At a smaller, less regional scale individual ports may see a reduction or increase in landings. Very few processors rely on a single port, so processors may be able to make up a reduction in landings made at one port with an increase in landings made at another. However, landings directed to a processor because of a relationship between a disadvantaged port and a processor may be considered to be “at risk” because it is not clear where landings will re-direct to. For example, under a purely market driven outcome it may be expected that landings into Neah Bay would decline or move to another port altogether, meaning that those processing centers historically receiving their fish from Neah Bay would have those landings be placed “at risk”. As indicated in the above information, these at risk landings have historically been processed in Astoria. However, this does not necessarily mean that Astoria will see a subsequent reduction in volume. It could very well be that landings historically made into Neah Bay are re-directed to Astoria or Westport (which are processed in Astoria). However, those landings may also be re-directed to Bellingham. Because the location of where those fish will be re-directed to is unknown, the relationship and associated volume that flows between Neah Bay and Astoria is termed “at risk”.

The fact that more ports in the north appear to be at a relative advantage than those in the south (particularly those south of Fort Bragg) means that a gradual shift of trawl activity may occur toward the north potentially putting at risk those landings and relationships that exist in the San Francisco area and areas further toward the south. Factors that may influence this potential shift include making an initial allocation to processors and implementing an area management provision. In addition, allowing trawlers to use fixed gear may influence this geographic shift. Harvesters in central California for example may shift to fixed gear and continue harvesting sablefish and thornyheads while trawlers to the north increase their take of flatfish by harvesting the flatfish catch foregone by vessels that have engaged in gear switching. Another factor influencing geographic shifts is an allocation to processors. Making an initial allocation to processors means that processing facilities could direct landings associated with their quota to areas that are beneficial to them. An area management provision would also influence this geographic shift by retaining a given proportion of quota to the south, restricting the ability of trawl activity to migrate north.

Because of shifts in the geographic distribution of landing activity, some processing facilities may no longer be necessary while others may need to expand. The cost to processors that may be adversely affected by these shifts depends on a number of factors. Processors may be able to relocate equipment, but that would need to be balanced against the cost of purchasing new equipment. The fungibility of immovable assets (buildings, wharves, etc. and the land upon which they reside) depends on the economic climate in the port region and whether the processor owns or leases these assets. If facilities can be easily put to other uses and there is sufficient demand, they could be sold; leased facilities could be turned back at relatively little cost. However, there may be human capital assets in a port, such as specialized labor and longstanding relationships with local suppliers that could be lost in the event of relocation. Finally, the actual depreciated value of the facilities would be a factor. A business would face the replacement cost of a fully depreciated asset anyway, so the cost of buying new assets because of relocation may not represent an added cost[31].

4.10.2.3 *Changes in the Quantity and Mix of Landings*

As discussed under the section describing impacts to limited entry trawl harvesters, the quantity of harvested species in the non-whiting sector is expected to increase as a result of rationalization. This is because of the individual accountability harvesters will face under rationalized fishery conditions and the perceived reward – in the form of increased harvests of currently under-utilized species – that will come about as a result of successful bycatch avoidance. The implications of higher harvest volumes could be positive for processors of non-whiting groundfish if higher harvest volumes decrease the cost of production.

To address the production cost issue, we examine available information from a variety of sources including the 2001 groundfish harvest specifications environmental assessment, reports prepared for the West Coast Seafood Processors Association and presented via public testimony at various Council meetings, and discussions with stakeholders in the shoreside processing industry. Information from the 2001 Groundfish Harvest Specifications EA provides a clear indication of cost per unit of production and available capacity. While this information is surely dated (costs have undoubtedly changed and industry consolidation may have reduced capacity), this information is useful for illustrating patters. In this EA, costs per pound of processing are indicated for 1997 and 2000. In addition, the total number of filleting stations is indicated for 1997 and 2000.

Year	Landings	Utilized Processing Capacity	Processing Cost per Pound
1997	56,209	83%	$1.55
2000	37,557	51%	$1.89

This time period is evidence of the effect on processors during a time period prior to recent restrictions on groundfish harvesting, and during the start of the period of recent groundfish harvest restrictions. Since harvest volumes are expected to increase in the non-whiting sector as a result of rationalization, the comparison of processing costs and capacity between 1997 and 2000 is relevant for inferring changes that may occur between status quo conditions and a rationalized fishery. From this information, several patterns become apparent:

- The cost per pound of finished groundfish product increased by 22% from 1997 to 2000.
- 83% of processing capacity was utilized in 1997, while 51% of processing capacity was utilized in 2000

31 This assumes that businesses accounting of depreciation accords with the actual, physical depreciation of the asset. For example, a business could assume a time period for depreciation but continue to use the asset after the end date because the asset is still usable. Purchase of new assets would then represent a cost they otherwise would not have had to bear.

- Information from PacFIN indicates the landings of non-whiting groundfish declined from 56,209 to 37,557 metric tons (2000 landings were 67% of 1997 landings)

From this information it is clear that excess capacity existed in the shoreside processing industry in both 1997 and 2000, but with substantially greater excess capacity in 2000. It is also clear that the cost per unit of processed product increased substantially in 2000. These changes appear to have occurred because of a decrease in landed volume of non-whiting groundfish. Several changes have occurred in the industry since 2000 including consolidation in the processing sector. This means that the amount of excess capacity in the industry in 2000 may have diminished, and also that because of this consolidation the cost per pound of processed product may be less now that what otherwise would have been the case without the recent consolidation. Nevertheless, it is generally accepted that excess capacity exists in the shoreside processing industry.

Analysis of potential increases in harvest volume suggests that landings in the trawl fishery may nearly double (depending on one’s level of optimism regarding bycatch reduction). Depending on the degree of increase in landings, existing yet idle capital may simply be re-activated, or new capital may be constructed. In any event, available information indicates that the cost per pound of finished product should decline in the shoreside non-whiting processing industry as a result of higher landings.

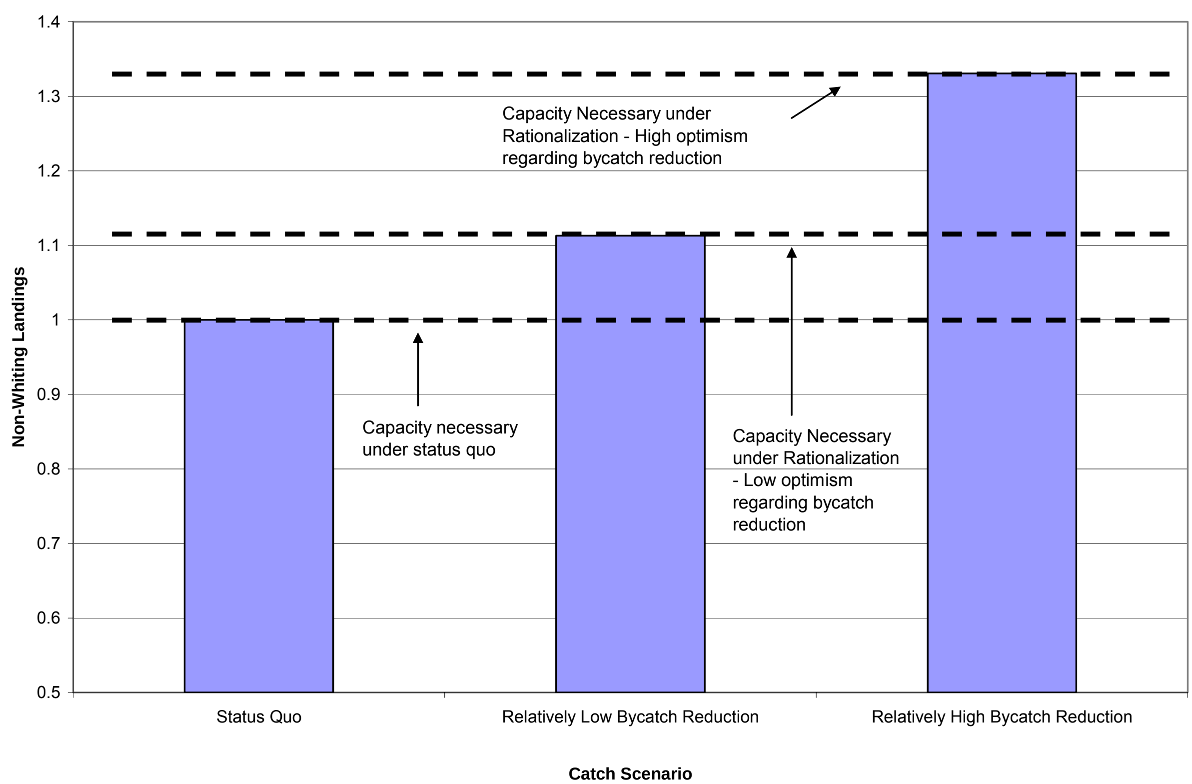


Figure 4–39 Estimated Volume of Landed Catch of Non-Whiting Trawl Caught Species

A source of uncertainty in this effect is the degree to which shoreside processors could market this additional volume. Since whitefish is a global commodity, processors of west coast groundfish compete in a global market with many substitute products. This is likely to mean increased efforts at marketing and selling the additional catch and these increased efforts may mean that the benefit to shoreside processors from increased harvest volumes may be realized over a longer time horizon as marketing efforts unfold and new markets are established.

In addition to overall volume, the mix in the type of species landed is expected to change. Many species are currently discarded for regulatory reasons and this need for regulatory discard is expected to be substantially reduced under rationalized fishery conditions. Many species currently discarded include rockfish, which are relatively valuable. Increases in the amount of these species landed at shoreside processing facilities are likely to be a source of benefit as processors are able to generate revenue on these higher valued species.

4.10.2.4 *Changes in the Timing of Landings*

An important effect of rationalization on the harvester side is to eliminate Olympic- or derby-style fisheries. This is because harvesters have control over an allocation of fish which is defensible from the actions of others. In the groundfish trawl fishery, the current 2-month cumulative landing limits have largely eliminated this form of Olympic-style competition in the non-whiting sector. The whiting sector remains a single, common quota-based fishery. With exception of the catcher-processor sector, which operates as a cooperative, the whiting fishery can be described as a derby with respect to both target species (the traditional race-for-fish concept), and important bycatch species (often coined "race-for-bycatch").

Rationalization assigns catch privileges to individual harvesters or cooperatives that coordinate their behavior, eliminating the need to compete. This traditionally has led to an increase in the length of the season and a reduction in the volume being harvested during peak time periods. In the whiting fishery, complete flexibility in the timing of landings is mitigated by regulatory measures to limit the bycatch of salmon and vessels' participation in other fisheries, such as the Alaskan pollock fishery, or other west coast fisheries. Chinook salmon bycatch is controlled to a large degree by the June 15 start date in the Shoreside sector; participation in the Alaskan pollock fishery will likely induce at least some participants to leave the west coast during the summer months. However, a reduction in peak harvest volumes could lead to a decrease in the amount of capital necessary to process whiting. Such a decrease in necessary capital should be expected to lead to consolidation of processing activity and this may translate to the downsizing or closure of some existing whiting processing facilities. Although difficult to estimate, the degree to which necessary processing capital may be reduced can be informed by ability for the whiting season to lengthen.

In recent years the shoreside whiting fishery end dates have varied between early and mid August with a start date for the primary season of June 15. Though the time period depends on several factors including the OY specified of Pacific whiting and the number of vessels engaged in whiting activity, this information means that the season has lasted 1.5 to 2 months in recent years. Anecdotal information and empirical evidence from the 2007 whiting fishery suggests that whiting become increasingly difficult to prosecute in a shoreside fishery around October 1. This October date of availability can essentially serve as a sideboard on the degree to which the season can lengthen. Using this October date as the possible extent of the primary whiting season means that the season could lengthen by an additional 1 to 1.5 months, or by 33-50 percent if peak volumes decline and are used to extend the season. This effectively serves as an upper bound estimate on the degree to which the need for shoreside whiting processing capital could decline. It is likely that the demand for shoreside whiting capital will not decline this far because many harvesters in the shoreside whiting fishery still participate in other sectors (the mothership sector) and other fisheries (the Bering Sea pollock fishery) which are time constrained, meaning many harvesters may still need to prosecute their fishing activity during the same time as status quo. This means that the season is likely to be characterized with a period of peak production that is the same as the existing period of peak production. However, the magnitude of that peak may decline somewhat, and the season may extend into the early fall. The decline in peak production is likely to be less than 33-50 percent.

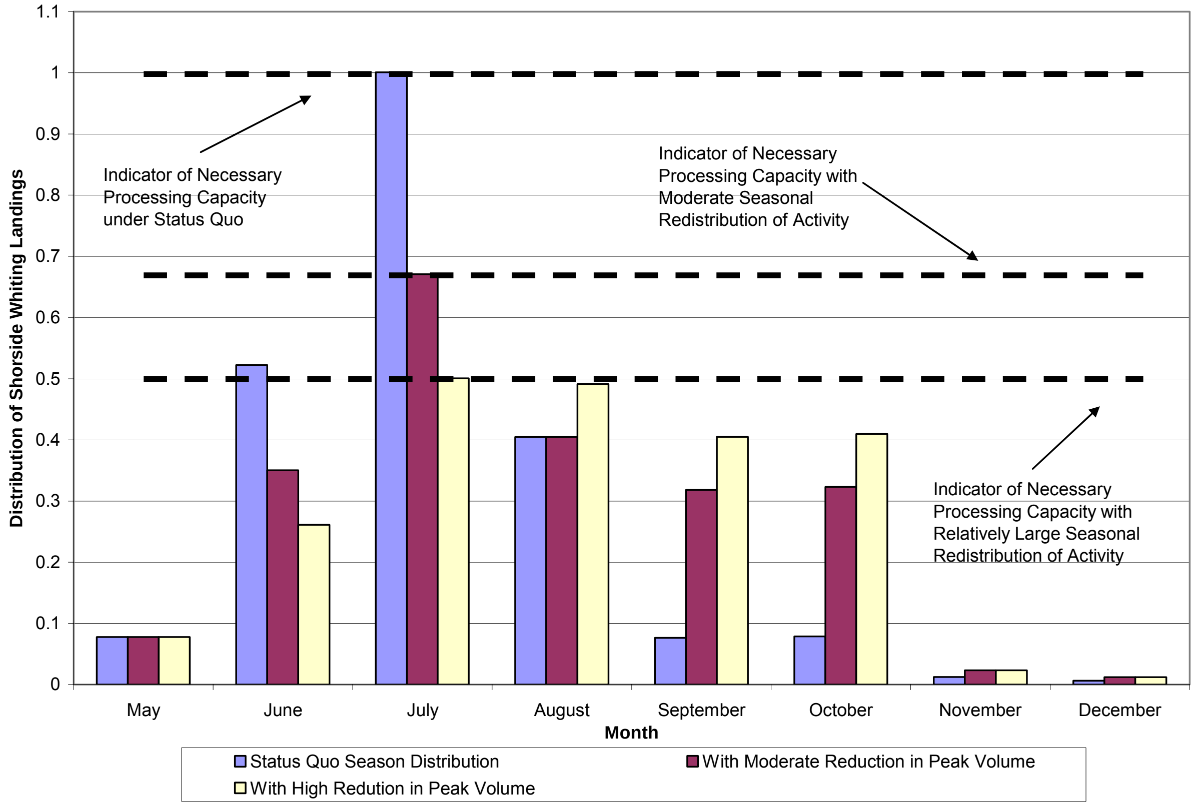


Figure 4–40 Estimated Seasonality of Shoreside Whiting Landings

In the non-whiting sector it is generally accepted that Olympic fishery conditions do not exist. Nevertheless, a quota share system could have some benefit in terms of greater control over the timing of landings in comparison to the current cumulative limit system. From the processors' perspective these changes in harvest timing are likely to be beneficial. Again depending on relative bargaining power, they would be able to optimize plant operations by better matching deliveries to the plants' characteristics (for example, how much fish can be processed in a given time period and the use of labor) and match product flow with market conditions.

4.10.2.5 *Market Restructuring of the Processing Sector*

Finally, rationalization could change the overall makeup of the processing sector through restructuring and making it more difficult for new firms to enter the sector. Currently, the West Coast processing sector is organized around a large operator and its subsidiaries, several mid-sized firms, and a larger number of smaller firms. If the trawl fishery is rationalized new opportunities may present themselves, leading to a restructuring of the processing sector. From the experience of other rationalized fisheries, there has been a move towards further consolidation of processing firms to counter the increased bargaining power of harvesters. Either through consolidation by direct purchase or joint ventures, integration could increase. This includes both horizontal integration—business arrangements among processors—and vertical integration—arrangements between processors and harvesters. An initial allocation of quota shares to processors could stimulate horizontal and/or vertical integration. First, quota shares are likely to encourage consolidation as more efficient firms are willing to buy up quota shares owned by less efficient firms. This could occur among processing firms or processing firms could buy up harvesters' quota shares (and their physical assets, such as vessels) increasing vertical integration. Depending on the availability of capital the converse could occur; more efficient harvesters could buy up processors' quota shares (and/or their physical assets) to vertically integrate. In general, such consolidation or integration would be encouraged by any resulting returns to scale: increased size and integration across a range of operations would serve to reduce overall costs. Joint ventures serve much the same purpose while retaining existing ownership arrangements.

4.10.2.6 *Product Recovery*

Regular supply is likely to increase "product recovery yield," or the ratio of the final weight of processed fish to the weight delivered to the plant.[32] Better use of plant equipment, fine tuning and modification of equipment, and better use of labor would lead to an increase in product recovery. Laborers working under more paced conditions would have the opportunity to more carefully cut fish; likewise, equipment could be more easily adjusted to maximize yield. As previously discussed, this is likely to be a bigger factor in the whiting fishery if its derby characteristics are eliminated. Since this is a high volume fishery with a generally highly processed end product, small changes in product recovery yield can lead to a substantial increase in profits. Initial allocation of quota shares to processors, functioning as a means of guaranteeing supply, could provide an incentive to make necessary capital investments to increase product recovery yield.

In the non-whiting fishery, some factors may lead to an increase in product recovery, while others may lead to a decrease. Since IFQs tend to increase certainty about the future and enhance business planning, new investments may be made in processing equipment which would lead to greater product recovery. However, less desirable fish may be landed in the non-whiting fishery as market discards and high grading are decreased. Since a discarded fish represent a cost to harvesters in a rationalized fishery (discards serves as a foregone revenue because any such amounts must be covered by quota pounds), there may be reasons for harvesters to land smaller and less desirable fish under a rationalized fishery than under status quo where small and unmarketable fish are more likely to be discarded. In general, smaller fish result in lower yields because a larger proportion of the fish comprises unmarketable parts (e.g., head and guts).

4.10.2.7 *Other Broad-Level Effects on Shoreside Processors*

The overall mix of landed species could change, both because of an increase in the quantity of target species and added flexibility to employ different harvest strategies. As already discussed, harvesters will have more control over the timing of their catch and it is expected that landings will be more evenly distributed throughout the year. These changes could benefit processors in at least two ways. First, harvesters should be able to increase the quality of landed fish, because a more measured pace of fishing will allow more attention to factors affecting quality (such as the amount of fish caught in a given haul and the storage of fish onboard the vessel). This may be more of a factor in the whiting sector because, as discussed above, currently it is more of a derby-style fishery. If harvesters are able to better control the quantity and mix of species in their landings, this could benefit processors by assuring a more stable supply, which would make it easier to maintain existing markets and develop new ones. With more stability in catches, harvesters and processors may be able to coordinate to develop new products and markets. Changes in harvest strategies, assuming they translate into reliable supply, could allow processors to more effectively market new product forms. Higher quality landings could benefit

[32] This is also discussed with respect to effects on harvesters, in Section 4.7.2.2

processors because they can deliver a higher quality—and perhaps higher priced—product to markets. Any premium realized again depends on relative bargaining power, however; if harvesters have relatively more bargaining power then they may be able to command a price premium for higher quality landings, reducing processors' profits from higher retail prices.

Several factors, while related to the changes in the harvesting sector that would induce a more regular supply of fish to processors, bear more directly on the operational characteristics of processors. These include operating costs, product recovery yield, ability to respond to market demand, and the ability to realize higher final product prices. As previously mentioned, these effects are more likely to be felt in the whiting fishery, because currently it is subject to greater variability in the timing of landings in comparison to the nonwhiting sector managed under cumulative landing limits. However, a more modest effect could be felt in the nonwhiting sector because harvesters would be released from what are essentially 2-month individual vessel quotas.

In a rationalized fishery, the cost of processing could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if, as discussed above, deliveries are steadier or made on a predictable basis. This would reduce the need to lay off workers when deliveries dip and pay overtime when delivery volume exceeds normal plant operating capacity. By the same token, the physical plant could be more efficiently used if inputs are supplied more regularly. For example, variable inputs like power and water might be obtained at lower cost if demand is more even. It should be emphasized that while operating costs could be lowered, changes in the relationship between harvesters and processors affecting bargaining power could change raw fish (input) costs. If harvesters are in a better position to negotiate prices then the overall cost to processors could increase.

To the degree that IFQs or cooperatives allow harvesters to time landings and coordinate with processors, rationalization could allow processors to better respond to changing market conditions along with the ability to develop new markets. Market conditions are subject to the changing tastes and preferences of consumers. A guaranteed supply of fish, and thus more steady supply to retailers, would allow processors to gauge these consumer preferences and develop products to meet them. Processors could also bring a greater variety of products to market, including new ones. This could include the development of specialized products for niche markets, based on the ability to reliably supply certain species or product forms.

Markets respond favorably to uniformity and predictability, and stronger guarantees of steady product deliveries could increase market penetration and the building of stronger relationships with retailers. West Coast fish providers (harvesters and processors) could in turn increase their share of the international whitefish market, for example by providing higher quality fillets to niche markets. Again, increasing the ability to guarantee supply to retailers and meet consumer demand for specialized products should increase profits for processors and potentially for harvesters, depending on their relationship with processors.

4.10.3 Effects of the Alternatives Revealed by Analytical Scenario

This section provides an analysis of the direct and indirect effects of the analytical scenarios on shoreside processors. It begins with an overview description of the manner in which each of the key elements of the analytical scenarios is expected to impact processors. The details of the analytical scenarios are provided in the remaining subsections, with a comparison to status quo and other analytical scenarios, as appropriate.

4.10.4 Expected Effects of Elements of the Analytical Scenarios on Shoreside Processors

A summary comparison of the key elements of the scenarios is provided below. Each of the analytical scenarios will impact groundfish processors in different ways. Before considering the impact of the analytical scenarios, we first examine how the elements of the analytical scenarios are expected to impact processors in a general sense. Following this discussion, we examine the impact of each analytical scenario on groundfish processors.

How does the implementation of an IFQ coop system impact processors relative to status quo?

IFQs and coops have a direct effect on the harvesting associated with a fishery. Processors may be affected indirectly from changes in the way harvesting activities are done, though if processors are allocated IFQ, they may have a direct influence over harvesting activity. Issuing catch privileges that are defensible and in a manner that makes harvesting entities individually accountable will lead to changes in the timing of harvesting operations, in the flexibility of harvesting operations, in the volume and mix of landed species, and potentially in the location of delivery and processing activity. Many of these effects were described previously. Changes in timing and harvest volume associated with the fishery may have some positive impacts to processors and potentially adverse impacts on others. Those processors that are the recipients of additional volumes of non-whiting groundfish may be positively impacted because of additional throughput (which creates potential for revenue) and lower per unit costs of processing. In addition, if the whiting fishery season length increases, production costs in the whiting fishery may decline because of less necessary capital to process the same amount of volume. Those firms able to capitalize on those lower costs may benefit. Furthermore, an increase in the season length of the Pacific whiting fishery and a subsequent reduction in peak harvest volumes allow for fine-tuning of production which tends to increase yield and product quality. However, because of a reduction in peak harvest volume, fewer processing companies and/or facilities may be necessary to handle harvest volumes of Pacific whiting, meaning some companies may find themselves without enough product to continue justifying processing operations of Pacific whiting. The same case can occur in the non-whiting fishery because of regional shifts in fishing patterns where those processors in areas seeing a reduction in non-whiting activity may find themselves without enough volume to justify operations, while those seeing an increase may benefit.

The decision to implement IFQs or whether to implement cooperatives may have different effects on processors. Much of the effect of IFQs or cooperatives on processors depends on whether processors are allocated quota (in an IFQ program) or whether they are tied to catch history (in a cooperative program). If processors are not allocated quota in an IFQ program, or are not tied to a permit in a cooperative program, then the effect on processors may be the same. The effect of allocating processors quota shares or establishing processor ties is described in a later sub-section.

IFQs and coops have the potential to increase certainty about future opportunities. With greater certainty to harvesters and, potentially, processors, better planning and efficient utilization of processing facilities can be achieved. Certainty about future opportunities can be achieved if processors hold quota share, or if they have established relationships with harvesters that hold quota share.

How does initial allocation of QS to harvesters make things different for processors?

The initial allocation of QS will affect the distribution of harvest activity, with some locations seeing an increase and some a decrease in harvest activity. This will have a secondary effect on processors, and some geographic locations may see a decline in processing activities while others may increase. Allocating QS to harvesters will also have an effect on exvessel prices paid to harvesters for fish. This is because harvesters with quota share may be able to leverage higher exvessel prices from processors if the entire allocation is made to harvesters.

How do processor initial allocations or ties affect processors?

If processors receive initial allocation of QS, then processors will have increased levels of bargaining power over exvessel prices compared to a case where they do not receive QS. Processors with initial allocation can vertically integrate and also engage in fish harvesting opportunities to some degree independent of other harvesters. This increases the ability of processors to “hold out” against harvesters while negotiating over exvessel prices.

Processors with quota share will gain increased flexibility for matching catch periods to market demand, and elongating the season for optimal processing efficiency. This creates opportunities for lower per unit costs; in combination with expanded market opportunities, this could lead to an increased ability to compete with groundfish providers in the global market.

The regional distribution of fishing activity, a result of harvester shares, may also be influenced by processors that receive initial allocation. Since processors have fixed and generally immobile processing plants, they may use their QS to contract for harvesters nearest existing facilities and maintain harvest volume to their facilities.

If processors are tied to harvesters in a cooperative system, the net effect on exvessel prices is not clear. The outcome of prices in this case may depend on personal relationships between the processing entity and the harvesting entity. In some Bering Sea cooperatives, profit sharing arrangements between harvesters and processors appear to have developed. Establishing a cooperative structure with processor linkages tends to create a structure where harvesters take into account the needs of processors and vice versa. This relationship begins to look like a vertically integrated firm and profit sharing between harvesters and processors may become more likely. However, this may only occur if both the harvester and processor are able and willing to coordinate activities with one another.

Finally, it should be noted that a processor linkage provision in a cooperative system does not decrease the quota available to individual harvesters. Therefore, establishing linkages in a cooperative system does not give processors direct control over any harvesting activity.

How will accumulation limits affect processors?

Accumulation limits restrict the amount of quota any single entity hold (the control limit) and the amount of quota that can be placed on a vessel (the vessel limit). A per vessel limit will impose limits on fleet consolidation which tends to restrict the economic performance of harvesters. However, this tends to spread out the amount of harvesting activity across a wider number of locations. If these locations result in a more wide-spread geographic distribution of vessels then this would tend to reduce the likelihood for closure of geographically disadvantaged processing facilities.

Control limits affect the ability of the processing sector as a whole to increase the amount of quota shares held by the processing sector. High control limits will tend to allow the processing sector to acquire more quota over time, while small control limits tend to favor harvesters and restrict the amount of quota the processing sector can acquire over time. This is due to the concept of scale economies. In general the structure of harvesting and processing will lead to more harvesters being present in a fishery than processors. Accumulation limits therefore tend to leave quota share in the harvesting sector more than in the processing sector simply because there may not be enough individual processing entities to acquire all of the quota if accumulation limits exist, though this will depend on the size of the accumulation limit and the number of processing entities. This will have a long-term effect on exvessel prices.

A restriction on control will tend to limit the degree of influence that the largest processors will have on the program, and therefore affect the distribution of economic performance. Large processors potentially affected by a control limit may have their participation in the fishery influenced by that limit, thus causing a re-distribution in the control over delivery, and therefore processing, activity.

How will a grandfather clause affect processors?

A grandfather clause tends to have a distributional effect on processors if processors stand to receive an initial allocation of quota share. Those processors that have historically been large producers stand to gain quota share in excess of the accumulation limits if a grandfather clause is adopted.

If large processing entities receive quota share in excess of the accumulation limits, this may have an effect on exvessel prices. This is because it creates the potential to have few dominant companies that hold large amounts of quota share.

How does the number and type of species covered affect processors?

The number of species covered will affect harvesters directly, and processors indirectly. As the number of species covered in the program increases, harvester flexibility – at some level – begins to decrease and this may have an effect on the outcome of the program. Species with low OY levels may impose risk to harvesters because of the uncertainty associated with what a vessel will catch while fishing and the cost of going into a deficit condition (see Section 4.7.2.3). If some of the species covered generate a high level of risk to harvesting operations, harvesters may avoid the targeting of certain target species that are associated with high risk species. The resulting effect on processors is a decrease in the amount of some species available to processors. Information suggests this may be true for shelf flatfish species which includes English sole, petrale sole during summer months, and sanddabs among others.

How do the number of trawl sectors influence processors?

The number of trawl sectors primarily concerns the ability of the shoreside sectors to trade quota among one another. Establishing four trawl sectors may, at times, make it difficult for either one of the sectors to operate if a target species in one sector becomes a constraining species in another. As shown under the section describing impacts to harvesters, establishing a four sector split on sablefish for example may constrain the shoreside whiting sector during years when sablefish bycatch is higher than expected. This could occur because shoreside whiting harvesters may not have a mechanism for acquiring additional sablefish quota to cover unexpectedly high bycatch. In the most extreme case, this constraint may lead to premature closure of the fishery and foregoing harvest of whiting. This would have an adverse impact to shoreside processors because less whiting would be delivered that could otherwise be the case. In a three sector alternative, both shoreside sectors can trade quota among each other as necessary thus providing a mechanism for covering unexpectedly large catches of non-target species in either sector that may be held by the other. This would tend to increase the likelihood that shoreside processors would receive the expected amount of harvest volume.

How will an adaptive management provision affect processors?

If processors do not get an initial allocation of quota shares, the adaptive management provision provides a mechanism to mitigate harm to adversely impacted processors. This may mean that some processors receive greater landings of groundfish than would otherwise be the case.

If processors are awarded an initial allocation (and therefore cannot be recipients of adaptive management quota), adaptive management will provide a distributional effect on processors. Some processors may gain while others loser because of the distribution of adaptive management quota to harvesters that deliver to certain processors.

Adaptive management could also provide a vehicle for entry of new processors, the development of specialty processing opportunities addressing niche markets, or to create goal-oriented processor-harvester arrangements.

How will area management affect processors?

For processors that operation both north and south, establishing an area management provision at 40° 10' N latitude will tend to decrease efficiency and processor flexibility relative to the lack of area management. This is because large processors would have less ability to optimize the location of their processing and buying activity and instead may need to retain a larger presence in both areas than may otherwise be the case. However, area management could increase the certainty that catch will continue to be delivered in each area, providing a positive effect for those locations that might otherwise stand to lose deliveries. Smaller processors that are located in only one of the management areas may have an increased likelihood that landings will continue to be made available in their region in the future.

Area management, combined with gear switching provisions for harvesters, may have an indirect effect on processors. If large scale gear switching occurs off certain areas of the coast, the harvest of many flatfish species may be foregone since non-trawl gear is less effective at catching many types of flatfish. In such an event, the inability for that flatfish quota to move to another area of the coast where trawl vessels may be located may result in the potential catch of flatfish being foregone. This will affect processors by decreasing the quantity of flatfish available to processors in areas where large scale gear switching takes place

How will a carry-over affect processors?

A carry-over provision decreases the cost to harvesters from going into a deficit condition, and therefore decreases the risk associated with harvesting activity. Such a change in risk may mean that harvesters are willing to prosecute target species that are associated with high risk species. This will have a secondary effect on processors because it may mean that processors are the recipients of shelf flatfish catch.

How will tracking and monitoring affect processors?

At sea monitoring primarily affects the cost of fishing. It will have only limited effect on processors, except to the extent that harvesters can bid prices received higher to cover added costs. High monitoring costs may also lead to higher levels of fleet consolidation and this may influence processors because of the presence of fewer harvesters to purchase fish from.

Implementation of shoreside tracking and monitoring could add to and affect processor operating costs.

4.10.4.1 *Scenario 1 (No Action)*

- Processor Net Revenues

4.10.4.2 *Scenario 2*

The net effect of scenario 2 on processor net revenues is not clear as it relates to status quo conditions. It is likely that processors will be the least well off under this scenario compared to the other non-status quo scenarios.

Under this scenario, IFQ are given to permits based on catch history. As noted above, this will lead to consolidation among the harvester fleet, and harvesters remaining in the fishery will have a stronger position from which to negotiate (and if necessary, hold out) for exvessel prices without fear of losing harvest opportunities to others. In addition, the fact that the harvesting sector has control over the quota share means that the fishery is likely to be prosecuted in a manner that benefits harvesters. As illustrated in Appendix C, this is likely to result in geographic effects with some ports standing to be at a disadvantage, and others at an advantage, because of rationalization. Those processors reliant on deliveries to disadvantaged ports stand to see delivery volumes potentially decrease.

Because they would not receive an initial allocation, processors would be worse off under Scenario 2 than Scenarios 3b, 4, or 5. Processors on the whole would also tend to be worse off under Scenario 2 than under Scenario 3a, which has a provision for adaptive management that could be used for mitigating effects on certain processors. It is not clear whether processors will be better or worse off under Scenario 2 compared to status quo.

Non-whiting processors

In general it is expected that processors will pay a higher exvessel price under this scenario compared to status quo, principally because the majority of quota share is distributed to harvesters. However, the cost of processing production (outside the cost of purchasing fish) may decrease under this scenario as volumes increase in the non-whiting sector. Under perfectly competitive conditions, those holding the quota share may be expected to bid away all of the profits from others. However, evidence suggests that existing non-whiting processors may have some influence over harvesting activity in the non-whiting sector because a relatively small number of firms process the majority of the harvest, and also because processors currently exert some influence over the timing of harvesting operations even though harvesters apparently wish to fish at other times. Because of this apparent influence, it is not clear that allocating IFQ to harvesters will mean that harvesters can bid-away all of the profits generated by processors, if any are actually realized. It is likely, however, that harvesters will increase their influence over exvessel prices, therefore increasing the cost processors incur from purchasing fish. On the other hand, the likely increase in harvest volume means that the cost of production may decline. The net effect on processors in this sector depends on the net effect of higher exvessel prices versus lower unit costs of production. If exvessel prices increase more than unit costs of production decrease, then processors may be worse off, but if unit costs of production decrease more than exvessel prices increase then processors may be better off compared to status quo.

This bargaining advantage that harvesters have over exvessel prices is likely to exist in the short term and possibly over the long term. While theory would suggest that quota could be purchased by processors over the long term (thus shifting some exvessel price negotiation advantage back to processors), the accumulation limits in this scenario will temper the ability of processors to purchase substantial quantities of quota. Accumulation limits in this scenario would lead to a maximum of 3 percent being controlled by any single entity, which is substantially less than the amount of groundfish currently handled by several West Coast processors of trawl groundfish.

Under this scenario, harvesters have a greater influence over the geographic distribution of activity than the processing sector, because of their control over QS. This control will have a geographic effect on where landings take place, and this will have impacts to processors. Those processors that rely heavily on ports where landings may diminish may see less volume than under status quo, while processors that rely heavily on ports where landings increase may see more volume than under status quo. Based on the regional comparative advantage analysis, processors of non-whiting trawl caught groundfish that are reliant on landings from Neah Bay, Crescent City, Fort Bragg, Moss Landing, and Half Moon Bay may see landings volume decrease, while processors reliant on activity from other ports may see volume increase. The following table illustrates the expected geographic effect of landing activity and how that influences processing entities. While specific business information is not provided, this information does indicate that many of the processing centers may have some of their existing sources of landings put at risk by geographic shifts in landing activity that could occur under Scenario 2. However, many of those same centers may stand to gain product because of geographic shifts at the same time (Astoria). This information is based on the geographic comparative advantage analysis contained in Appendix C, and the information collected on where processing plants are located and where those plants receive their fish.

Processing Centers With Some Landings At Risk due to Regional Shifts in Fishing and Delivery Activity
Astoria
Bodega Bay
Eureka
Fort Bragg
Half Moon Bay
Hawaiian Gardens
Morro Bay
San Francisco
San Jose
Sand City
Santa Rosa
Scotts Valley
Watsonville

Under scenario 2, several processing companies stand to gain quota share. Although quota is not explicitly allocated to processors under this scenario, the fact that several processing companies own trawl permits means that some quota share will be held by processors. The following figure illustrates the quota share received by processing entities under this scenario.

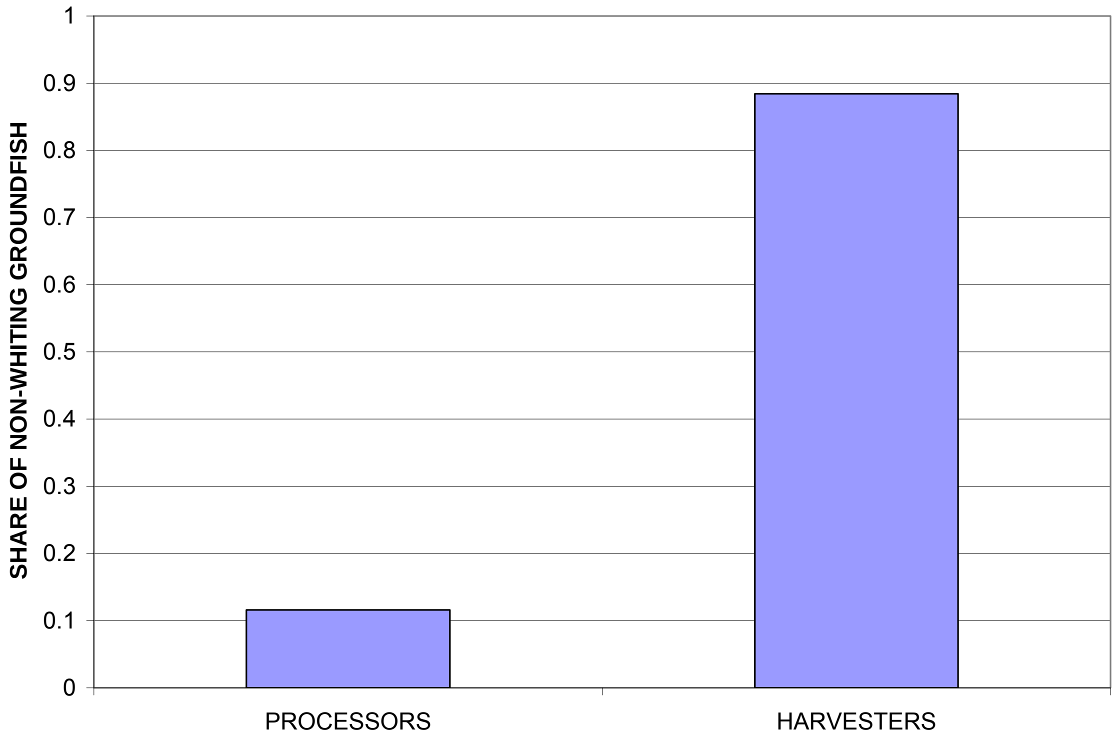


Figure 4–41. Share of non-whiting groundfish allocated to harvesters and processors in scenario 2.

Shoreside Pacific Whiting Processors

As noted in the harvester section (4.7.2.2), fleet consolidation will take place among shoreside whiting vessels, but not to the extent of the non-whiting portion of the fishery. Harvest activities are bounded by resource accessibility and seasonality of other fisheries, particularly Alaska pollock in the North Pacific. Geographic migration of the stock to the north imposes a resource access issue because shoreside whiting processors are limited to areas that range from northern California to southern Washington, and the depth-based migration of the stock poses an access issue because harvesters in the shoreside fishery have difficulty fishing at depths where whiting are found later in the year.

The length of harvesting activity in the shore-based harvesting sector is expected to elongate under a rationalized fishery to some degree. This change in the pace of harvesting will tend to increase product quality and therefore increase the value of Pacific whiting harvests. However, since the holders of quota share are able to bid away profits from others, it is likely that harvesters will bid up higher exvessel prices, thus increasing the costs processors must bear for acquiring fish. The elongated season is also likely to result in less processing capital being necessary to handle harvest volumes. If the length of the season increases by 33 to 50 percent, the amount of processing capital needed to handle the same volume may decrease in a similar fashion because there is less volume at any given time. Such a decrease in processing capital is likely to decrease the cost associated with processing outside the cost of acquiring fish from harvesters. However, this decrease in the need for processing capital will also decrease the asset value of processing equipment that is no longer necessary. Those owners of that equipment would tend to be adversely impacted if that equipment cannot be sold or put to another use.

The net effect of this scenario on shoreside whiting processor profits is not clear, however harvesters may have more leverage over exvessel prices in the whiting fishery than in the non-whiting fishery.

Available information indicates that new entry into the whiting processing sector has occurred in recent years, which is a form of competition among processors. This competition means that individual processing entities may not exert as much influence over harvest operations and prices as in the non-whiting sector. In addition, the rationalization of the fishery and resulting end of race-for-fish conditions means that harvesters in the whiting fishery can "hold out" against processors without losing available harvest, increasing their negotiation stance over processors. Such new entry into processing does not appear to exist in the non-whiting processing sector, and the fact that race for fish conditions do not appear to exist in the non-whiting fishery means that harvesters in that sector currently have the ability to "hold out" to some degree without losing available harvest volume – at least within the two month period. Therefore, exvessel prices paid by processors for shoreside whiting are likely to increase more than in the non-whiting sector. However, since the cost of processing is likely to decline as a result of lower peak harvest volumes, the net effect on the shoreside processing industry in the aggregate is not clear. It is possible, however, that certain processors could be adversely impacted if their assets lose value, while other processors could be positively impacted if their production volume increases.

The negotiation power over exvessel prices will shift from processors to harvesters, at least in the short run, in Scenario 2 relative to status quo. Over the long term, however, processors may be able to acquire enough Pacific whiting quota to influence exvessel prices. The control limits specified in this scenario could allow four business entities to control the harvest of shoreside whiting. Since there are currently more than four shoreside processing entities, this scenario could conceivably allow processors to have control over all of the whiting IFQ over the long term. In addition, under the initial allocation provision, some processing entities will receive an initial allocation of quota because they own limited entry trawl permits.

Geographic shifts in the delivery of shoreside Pacific whiting are not expected to occur, at least to the degree that it can be anticipated. Since shoreside whiting processing facilities are geographically constrained to an area that ranges from central Washington to northern California, there is limited opportunity for additional processors of whiting to become established elsewhere, and therefore there is limited opportunity for harvesters to deliver to other locations. Furthermore, the fact that the processing of shoreside whiting relies on a large investment in relatively specialized capital means that it should be expected to be relatively difficult for new companies to enter into the processing of shoreside whiting. Therefore, it is reasonable to expect that the delivery location of shoreside whiting under rationalized fishery conditions should remain the same or similar to the existing delivery locations. One factor that may influence these patterns however is if a large processor of shoreside whiting closes operations because of consolidation in the shoreside whiting processing industry.

Processors of shoreside whiting are expected to be the recipients of some quota share even though no explicit allocation is made to processors. This is expected to occur because of trawl permits that are held by shoreside processors. However, because of the small amount of quota share estimated to be allocated to processors and the small number of processing companies, the actual data is not presented. However, processors receive less than 5 percent of shoreside whiting quota under this scenario.

4.10.4.3 *Scenario 3*

Many of the provisions under Scenario 3 are similar to those of Scenario 2, but Scenario 3 is specifically designed to compare two methods for addressing processor concerns. One method (Scenario 3a) provides that an adaptive management provision be available and used to mitigate against adverse impacts to processors.[33] Such a program is likely to benefit those processors that are recipients of this

[33] To be clear, the suite of alternatives allows the adaptive management provision to be used for things other

quota (and the communities in which they reside), although it may not yield the most efficient outcome in terms of national economic development gains expected from rationalization.

The second method (Scenario 3b) provides for an initial distribution of quota shares to processors, including 25 percent of groundfish QS and 50 percent of whiting QS. This scenario will have a distinctly positive effect on processors relative to Scenario 2 in terms of their bargaining power over exvessel prices. Harvesters with QS will gain bargaining power because of their holdings of quota share, but also through fleet consolidation. Such fleet consolidation limits the number of vessels that processors can negotiate with, and therefore limits the ability of processors to shop around for harvesters willing to fish at lower exvessel prices. The fact that processors begin with some initial allocation means that they can vertically integrate and also engage in fish harvesting opportunities to some degree independent of other harvesters. This increases the ability of processors to “hold out” against harvesters while negotiating over exvessel prices. It is almost certain that the ability for processors to negotiate lower prices increases as their ownership of quota increases; however, it is not certain whether the initial allocation options that grant quota to processors will increase or decrease their negotiation stance relative to status quo.

In general, those holding quota shares experience more certainty about the future than those entities that do not. This increased certainty provides for better business planning in the long term. This greater degree of certainty can be expected to lead to greater degrees of reinvestment into fishing and/or processing related capital equipment and technology. This is because enhanced certainty makes profit expectations – and the ability to pay back loans taken for investments – more certain. Over time, the reinvestment of financial capital back into fishery related industries may very well improve the overall economic status of fishing related industries since such reinvestment will be driven by the expectation of profits associated with that reinvestment. Those entities that do not hold quota shares are less likely to reinvest into fishery related activities, and the result may be deterioration in the status of equipment used by those entities. Such an outcome was observed in the Russian Far East where quota shares were auctioned off. The result was a serious deterioration in the economic situation of fishing enterprise (Anferova, et al., 2004). Although auctions work differently than quota shares that are initially allocated over the long term (and therefore the outcomes may be quite different), the perspective of an entity engaged in purchasing quota through an auction is inherently shorter term than an entity that owns quota share. In a program where quota shares are intended to be long term, those entities that do not hold quota shares are likely to have a greater degree of uncertainty about the future than those entities that do hold quota shares. Therefore, if processing companies do not hold quota shares, the level of reinvestment is likely to be smaller than if they do hold quota shares. Furthermore, the level of reinvestment made by each entity is likely to be correlated with the level of quota share held by each entity.

A distribution of QS to processors, as in Scenario 3b, will tend to have a geographic effect as those processors direct landings associated with their quota shares to particular ports where their plants are located. In contrast, an adaptive management provision (Scenario 3a) will tend to have geographic consequences, as well, if adversely impacted processors are located in distinct areas and adaptive management shares are directed to processors in those distinct areas. The following figure illustrates the geographic implications of A) allocating non-whiting quota to permits entirely, B) allocating 75 percent of the non-whiting quota to permits and 25 percent to processors, and C) allocating 100 percent of non-whiting quota to permits, but reapportioning 10 percent of that quota through an adaptive management provision to adversely impacted processors. For analysis we assume that adversely impacted processors are in Moss Landing and Half Moon Bay.

than for processor concerns such as to mitigate against the effects on adversely impacted communities, and to provide incentives to use habitat- and bycatch-friendly gear

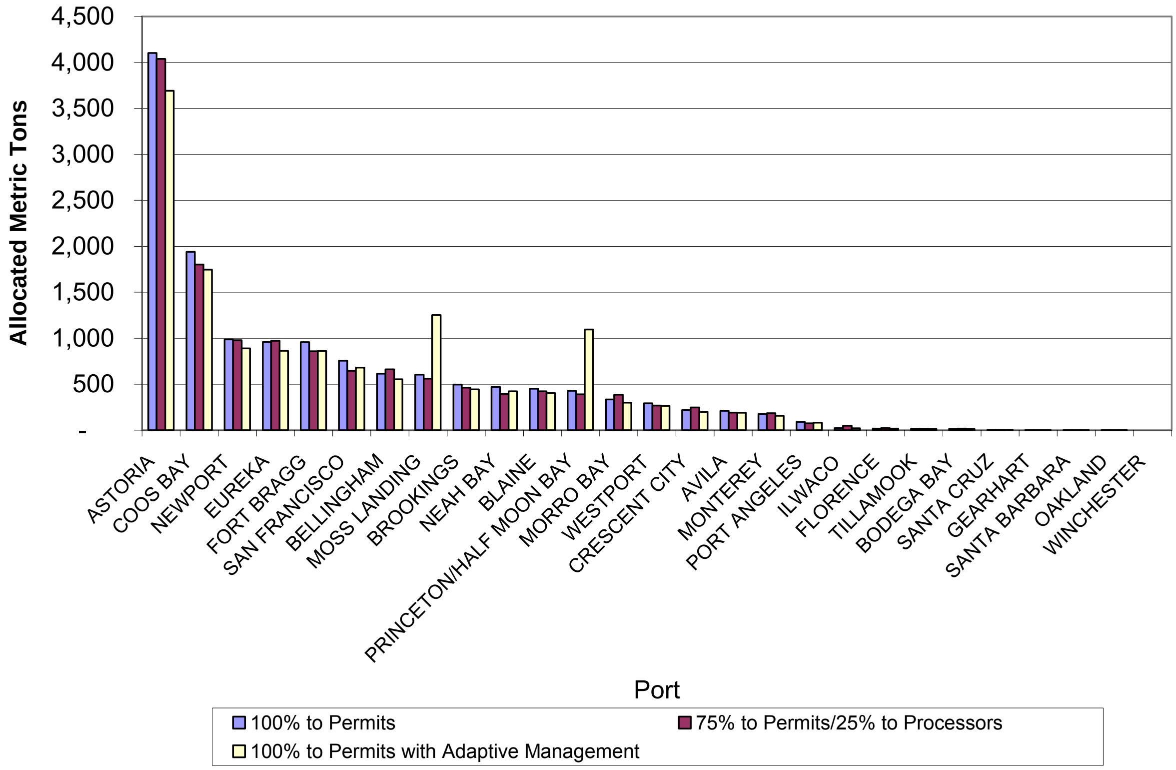


Figure 4–42. geographic distribution of non-whiting quota share.

In the whiting fishery the geographic effect is somewhat different than in the non-whiting fishery. For the at-sea portion of the whiting fishery, allocating to permits or to processors are not expected to change the fact that at-sea activity is primarily tied to the Puget Sound region. For the shoreside whiting fishery, geographic differences exist. In particular, Coos Bay is affected substantially by the choice of whether to allocate in part to processors or not. An adaptive management provision used in the shoreside whiting fishery to mitigate against adverse impacts to processors would presumably alter the geographic distribution of shoreside whiting landings.

The distribution of whiting QS under Scenario 3a is difficult to predict, because the only port that is engaged in the whiting fishery and labeled as “potentially disadvantaged” is Crescent City. While it may be possible that all of the adaptive management whiting quota is directed to Crescent City, such a distribution is unlikely since it would represent a higher delivery of Pacific whiting to the port than under status quo conditions. Furthermore, devoting such an amount to Crescent City would exceed the 5 percent of Pacific whiting devoted to California fisheries prior to the June 15 primary shoreside season start date. Since no change is contemplated in this allocation, devoting such a large share (ten percent) to Crescent City seems unlikely. Therefore, the processors that are possible recipients of shoreside whiting adaptive management quota are largely unknown.

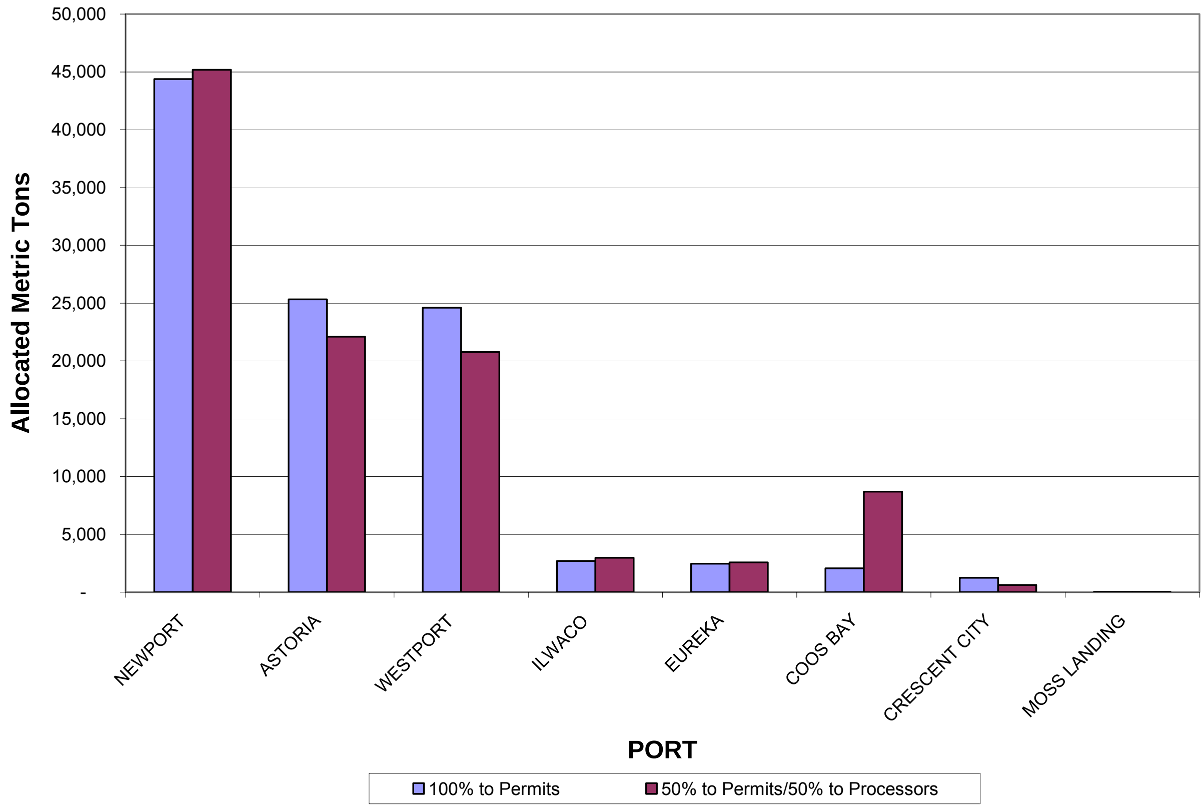


Figure 4–43. Geographic distribution of shoreside whiting quota.

An adaptive management provision may place downward pressure on exvessel prices. If used as envisioned, such an adaptive management program will tend to place emphasis on certain processors or communities. However, this is true only if harvesters are prosecuting groundfish subject to adaptive management, which comprises ten percent of the QS. A limit on the number of potential buyers may have a downward effect on prices paid for the adaptive management fish. However, the adaptive management provision is not likely to impact exvessel prices to the same degree as initial QS to processors, simply by virtue of the difference in volume attributed to processors. In Scenario 3b, the amount of initial allocation to processors is approximately 33 percent for non-whiting groundfish, and approximately 58 percent percent for whiting.[34] A 10 percent adaptive management provision intended for use by adversely impacted processors is small in comparison.

Over the long run processors may continue purchasing quota shares in the whiting sectors because of the relatively large size of the control limit. The 25 percent control limit specified for the shoreside and mothership whiting sectors means that four entities could theoretically control the harvest of whiting in both sectors. It is unlikely that processors will acquire much additional quota in the non-whiting sector because of the control limits. The 3 percent control limits specified for the non-whiting sector make it difficult for the processing sector as a whole to acquire additional quota, unless, over time, that sector becomes comprised of multiple small producers. This means that over time, exvessel prices in the shoreside whiting sector may fall to some degree since processors have the ability to acquire additional quota, but it is not likely that exvessel prices will fall over time in the non-whiting sector because processors have limited ability to purchase additional quota.

[34] These numbers exceed 25 percent and 50 percent respectively because some processors own trawl permits.

If processors are allocated initial QS (Scenario 3b), they may play a greater role in directing the location of harvests, since they could enter into harvest contracts that include delivery points. This could help to at least partially offset any negative effects on processors from broader level regional shifts in landings that may occur if harvesters control quota. Vessels in ports where processors are located may have access to more quota than if an initial allocation was made to permits. In addition, initial allocation of QS to processors could enhance their ability to create joint ventures or other arrangements among processors (horizontal integration) and between processors and harvesters (vertical integration).

The distribution of QS across entities under Scenario 3b is different than under Scenario 2 because of the allocation to processors. In total, there are 121 entities that are expected to receive quota shares of non-whiting groundfish under Scenario 3b, and three of these entities exceed the control limit (but are grandfathered). Under this option, the majority of receiving entities receive less than 1 percent of the non-whiting allocation of groundfish, while a handful of entities receive over 2 percent. The figures illustrating this concept can be found under the corresponding section on harvesters.

In the whiting sector there is also a different distributional effect, though the difference between Scenarios 2 and 3b is relatively less for the whiting sector than the non-whiting sector. Interestingly, by including shoreside processors in the initial allocation, the distribution of shoreside whiting becomes relatively more uniform than in Scenario 2. The largest recipient of shoreside whiting QS receives less than 10 percent of the shoreside whiting quota, while under Scenario 2 the largest recipient receives almost 12 percent. A total of 67 entities are estimated to receive shoreside whiting QS under this scenario. The figures illustrating this concept can be found under the corresponding section on harvesters.

4.10.4.4 *Scenario 4*

The elements of Scenario 4 for the non-whiting fishery differ somewhat from Scenarios 2 and 3. However, there is a considerable difference in the whiting fishery under Scenario 4 in that harvest cooperatives are established for each of the three whiting sectors. This has an effect on processors, primarily in terms of the negotiating relationship over exvessel prices and/or profit sharing arrangements that may develop. With a harvester cooperative, the effect on bargaining position and the change in exvessel prices can not be predicted, as it largely rests upon personal relationships and the bargaining skill of the negotiators. However, if the mothership sector is an indicator, cooperatives may lead to profit sharing arrangements among processors and harvesters.

A feature unique to Scenario 4 is that there would be four trawl sectors, rather than three for the other scenarios. As indicated above, establishing a four trawl sector split may inadvertently constrain one or both of the shoreside sectors in certain years if bycatch of a non-target species is higher than expected. This could occur if Pacific whiting bycatch is higher in the non-whiting sector than expected and harvesters in that sector have no means of acquiring quota to cover that bycatch. In the worst case scenario, harvesters in this sector may have their harvest opportunities truncated by bycatch of Pacific whiting and this may lead to adverse impacts on shoreside processors because of a lack of delivered volume.

Both Scenarios 4 and 5 feature processor initial allocation of QS and adaptive management. In contrast to Scenario 5, which provides QS only to whiting processors, the adaptive management provision is more likely to be used to encourage gear switching or the development of gear with lower bycatch, rather than assisting disadvantaged processors. This is because the initial QS to groundfish processors already has a mitigating effect.

The accumulation limit for the shoreside groundfish sector is three percent under Scenario 4, and lower (more restrictive) than Scenarios 2, 3, and 5. This will affect the larger processing companies that also have permits by limiting future consolidation, acquisition of smaller processing companies or vessels, and their purchase of QS.

Non-Whiting Processors

As is the case with Scenario 3b above, Scenario 4 provides for an initial distribution to processors of 25 percent of groundfish QS. This scenario will have a distinctly positive effect on processors in terms of their bargaining power (relative to scenario 2) with respect to exvessel prices, and will tend to offset the gains in bargaining power by harvesters. The long run effect on exvessel prices is expected to remain relatively unchanged from the period following implementation. This is because of the accumulation limits specified under this scenario are much smaller than in Scenario 2 and 3, and will act as a de-facto limit to the amount of quota that processors are able to attain. The 1.5 percent control limit over all non-whiting groundfish, without a grandfather clause provision, means that the amount of quota allocated to processors will need to be divided among at least 17 processing companies. Several processors that qualify for an initial allocation will have their initial allocations truncated by the lack of a grandfather clause. That some historically large producers will have their initial allocation truncated means that exvessel prices could be higher than it would be under scenario 3b, where some large producers receive relatively large amounts of quota. Having some entities with relatively large amounts of quota may make those entities more dominant in the negotiation, potentially influencing exvessel prices in the aggregate, while not having entities with such large amounts of quota would tend to erode that dominant position.

A distribution of quota shares to processors will tend to have a geographic effect as those processors direct landings associated with their quota shares to particular ports where their plants are located. In contrast, an adaptive management provision will tend to have geographic consequences, as well, if adversely impacted processors are located in distinct areas and adaptive management shares are directed to processors in those distinct areas. Figure 4–41 above illustrates the potential geographic distribution of quota under a 25 percent to processor allocation rule (Scenario 4).

Compared to Scenario 3b, the area management provision in Scenario 4 divides species north and south of 40° 10’ N latitude could be beneficial for some processors while having negative consequences to others. Area management effectively ensures that markets are retained in each area, and harvest quota will be allocated accordingly. The regional opportunities are enhanced by processor QS, where they can entice harvesters to contract and deliver to their plants. Processors with plants in both north and south areas could be negatively affected by area management if it causes inefficiencies within the firm’s allocation of capital resources. For example, a processing company may find it most cost effective to close existing plants and concentrate landings in one area of the coast. Area management restricts the ability of processing companies in such a position to undergo that type of reorganization, thus restricting potential profits achieved as a result. In addition, area management combined with large scale gear switching may mean that the harvests of some types of shelf flatfish are foregone, as discussed previously. This would tend to reduce aggregate volume to processors from what would otherwise occur.

Pacific Whiting Processors

The relationship between Pacific whiting harvesters and processors that is formed through coops for harvesters in this scenario is different from the relationship established by issuing both sectors IFQ. The exvessel prices that result through a harvester-processor affiliation (linkage) could very well be different from the negotiated exvessel prices when both harvesters and processors receive IFQ. While harvesters and processors that both receive IFQ are not limited to whom they can buy and sell, harvesters and processors in a cooperative structure with a linkage are contractually bound (though the linkage can be broken with some effort). This linkage means that negotiation and relationships that exist between the harvester and processor are likely to have a large influence over exvessel prices in the short term, as opposed to a market-driven outcome. Over the long term, harvesters and processors can break that arrangement if the harvester fishes in the "non-cooperative" portion of the fishery, though this fishery is a competitive, derby-style fishery which makes it unattractive and arguably less profitable. Though there may, at times, be an incentive to break the linkage and seek higher prices elsewhere, doing so may come at a cost.

The distribution of harvest opportunities under a cooperative structure with harvester-processor linkages is in many respects more similar to Scenario 2, with 100 percent of the initial allocation going to permits, than for Scenario 3b where an initial allocation is made to both harvesters and processors. This is because under a cooperative system with processor linkages, the harvester still controls the opportunity to harvest the available quantity. That quantity is not made available to processors, as would be the case if IFQ was allocated to processors.

4.10.4.5 *Scenario 5*

The elements in Scenario 5 reflect some features of each of Scenarios 2, 3, and 4. Scenario 5 differs primarily in the results of the initial allocation formula, the presence of a grandfather clause, the lack of an initial allocation to processors for groundfish but a 50 percent allocation of whiting, the merging of both shoreside sectors into one, area management, and the presence of an adaptive management provision. Other elements of this scenario differ, but do not appear to have a noticeable effect on the outcome.

Both Scenarios 4 and 5 have a processor allocation of QS (whiting only under Scenario 5) and adaptive management. A distribution of QS to whiting processors will tend to influence or direct landings to particular ports where their plants are located; an adaptive management provision will also have geographic consequences. The adaptive management provision could be used to mitigate adverse impacts to communities, particularly ports with non-whiting processors. It could also be used to encourage gear switching or the development of gear with lower bycatch. Depending on the objective, the distribution of these effects is likely to be different.

An adaptive management provision may place downward pressure on exvessel prices. However, this is only true if harvesters are prosecuting groundfish subject to adaptive management, which comprises 10 percent of the QS. A limit on the number of potential buyers may have a downward effect on prices paid for the adaptive management fish.

An area management provision in Scenario 5, as in Scenario 4, divides species north and south of 40° 10' N latitude. This could be beneficial for certain processors in both areas by effectively ensuring that markets are retained in each area, and harvest quota will be allocated accordingly. For some larger processors with plants in both north and south areas, area management could affect efficient allocation of the firm's capital resources.

Non-Whiting Processors

Non-whiting processors are expected to see profits decline under this scenario. As in Scenario 2, exvessel prices paid to non-whiting trawl harvesters will tend to be higher because the initial allocation of IFQ is made only to permits, which enhances harvesters' negotiation power. This bargaining advantage away from processors is likely to exist in the short term and possibly over the long term.

Quota could be purchased by processors over time (thus shifting some advantage back to processors); however, the accumulation limits will temper the ability of the larger processors to purchase substantial quantities of quota. Accumulation limits in this scenario would lead to a maximum of 2.2 percent being controlled by any single processor, which is considerably less than the amount of groundfish currently handled by several West Coast processors of trawl groundfish.

Pacific Whiting Processors

Scenario 5 will have a positive effect on whiting processors in terms of their bargaining power with respect to exvessel prices because they are allocated 50 percent of initial QS. Processors can vertically integrate and engage in fish harvesting opportunities independent of other harvesters. The ability for processors to negotiate lower prices increases as their ownership of quota increases; however, it is not certain whether the initial allocation to processors will completely offset the gains in negotiation power to harvesters relative to status quo.

4.10.4.6 *Comparative Summary of the Effects of the Analytical Scenarios*

Scenario 1	• Continued status of overcapitalization and relatively low processed volume among non-whiting processors • Continued status of overcapitalization as a result of derby conditions in shoreside whiting industry
Scenario 2	• Higher cost of purchasing fish from harvesters in non-whiting and whiting sectors compared to status quo • Lower cost of production in non-whiting due to increased harvest volume. Lower cost of production in whiting because of increased season length and processor consolidation. • Geographic shift in processing activity occurring on a localized scale and a wide-scale perspective as a result of shift in landings
Scenario 3a	• Lower cost of production in non-whiting due to increased harvest. Lower cost of production in whiting because of increased season length and processor consolidation. • Select, adversely impacted processors receive quota through adaptive management, minimizing disruption of activity • Processors that are not recipients of adaptive management may be affected similarly to scenario 2 • Potentially less geographic shift as a result of adaptive management
Scenario 3b	• Lower cost of production in non-whiting due to increased harvest. Lower cost of production in whiting because of increased season length and processor consolidation. • Processors pay lower prices for fish from harvesters than in scenario 2 • Differential geographic shift than in scenario 2 and 3a – movement of activity toward processors with quota share
Scenario 4	• Lower cost of production in non-whiting due to increased harvest. Lower cost of production in whiting because of increased season length and processor consolidation. • Non-whiting processors pay lower prices for fish than in scenario 2 • Whiting processors may pay lower prices for fish than in scenario 2, or may enter into profit sharing arrangements with harvesters • Minimal wide-scale geographic shifts, but some localized shifts affecting localized processors
Scenario 5	• Lower cost of production in non-whiting due to increased harvest. Lower cost of production in whiting because of increased season length and processor consolidation. • Non-whiting processors may pay relatively high prices for non-whiting groundfish

- Shoreside whiting processors may pay lower prices for whiting than scenario 2 and 3a. Unclear how this compares to scenario 4
- Minimal wide-scale geographic shifts, but some localized shifts affecting localized processors

4.11 Mothership Processors of Trawl Groundfish

Trawl rationalization may result in a range of impacts on motherships, varying in extent and degree depending upon analytical scenario. As a result of rationalization, it is likely that impacts to motherships will be distributed according to whether harvesters are issued IFQs or form cooperatives, and the extent of subsequent consolidation of fishing and processing enterprises. Impacts may also occur based on the extent to which MS companies gain and control quota shares. The types of impacts and associated mechanisms relating to the trawl IFQ program on motherships are outlined in more detail below.

In this section, we describe the impacts of rationalization on mothership processors of trawl-caught groundfish. This group is composed of off-shore businesses that principally receive whiting directly from harvesters, and conduct processing activities on the fish in order to make product forms that are usable at the wholesale and/or retail market level. In several cases, entities holding limited entry trawl permits may also operate motherships. Such entities are included among those examined in this section.

The section begins with a description of the metrics used to illustrate the effects on motherships. The variables and metrics used, some of which are also used in earlier sections, can be compared and contrasted among the analytical scenarios. The broad-level effects of rationalization on motherships are presented next, which includes a discussion of important general issues associated with rationalizing the fishery.

Following the description of broad-level effects, we assess the impacts on motherships of the analytical scenarios. This section begins by identifying the impacts that are expected to occur from each of the elements of the scenarios independently. We then provide an assessment of each analytical scenario on motherships. Finally, we assess cumulative effects of rationalization on motherships. The combined effect of these past, present, and reasonably foreseeable future actions are merged with the effect of the analytical scenarios to arrive at the cumulative effect.

4.11.1 Methods for Assessing Impacts

The section contains a brief overview of the methodology we used for assessing the impact of rationalization on processors, including the ways in which each of the expected impacts is measured and assessed. A summary was presented in a previous section above, and included the potential impacts, the reasons why those impacts occur (the mechanisms), and the way in which those impacts are measured (the metrics). The potential impacts to motherships are measured as changes in economic performance, or profitability, of individual businesses, and changes in economic efficiency of the processing sector as a whole. Changes are initiated by at least eleven identifiable mechanisms, described in some detail in Appendix C, along with the methods anticipated for examining the impacts.

4.11.1.1 *Potential Impacts, Mechanisms, and Metrics*

Bargaining Power: The negotiating relationship that exists between motherships and harvesters with respect to exvessel prices is a reflection of relative bargaining power. The alternatives would result, at one extreme, in 100 percent of QS to permits; motherships believe they will be at a relative disadvantage in setting ex-vessel prices. At the other extreme, issuing fishing QS for motherships would, it is argued, guarantee that certain motherships would have access to product, above and beyond the QS they may also receive as permit owners. This increased access to product could reduce a mothership company's need to compete in the marketplace for an independent harvester's fish. Finally, the establishment of harvester coops, with an accompanying linkage to MS processors, provides an additional dimension to bargaining power where there is a near balance between the buyer (mothership) and seller (harvester).

The relative shift in bargaining power for motherships is assessed qualitatively. A review of the economic literature is made with particular emphasis on applications to fisheries or similar common property situations. The experience of other fisheries is also examined for any conditions that may be applicable.

Initial Distribution of IQ and Coops: The manner in which IQ is initially distributed will have an effect on the mothership sector, especially if motherships receive designated QS. The analysis of the initial distribution originates from two models: 1) a quantitative analysis of initial shares based on historic landings, and 2) a delineation of processor ownership combined with historic purchases of landed trawl-caught groundfish. Applying the distribution rules for each of the alternatives on the two models yields output that can demonstrate the patterns of initial IQ.

The establishment of harvester coops instead of IQ, when combined with processor affiliations in the MS sector, will also affect mothership processors. Establishment of coops will affect the bargaining relationship, as noted above, but could also affect how motherships respond to market conditions, as well as their operations in terms of enticing or influencing harvester activities.

Harvest Timing: The rationalization program will tend to slow the pace of derby style fisheries that exist in both the shore-based and mothership sectors of the whiting fishery. Currently, the timing and length of the whiting season is highly influenced by levels of salmon bycatch, as well as the Alaska pollock season in the North Pacific, in which both whiting harvesters and whiting motherships participate. Harvest timing could affect motherships by lengthening somewhat the period of harvest, and influencing the hiring and use of processor labor.

Barriers to Entry: At present, the mothership sector is fairly stable in size, as new entrants must overcome significant capital requirements, market structure, and well-established marketing relationships. In a rationalized trawl fishery, barriers to entry may be eased if the potential entrant has buying history or acquires QS and can essentially direct guaranteed harvests. A qualitative assessment was conducted describing the effects of barriers to entry on processors.

Market Restructuring: The mothership sector is organized around fewer than ten large or moderate-sized entities and their subsidiaries, and a smaller number operating in any one year. In a rationalized trawl fishery, some changes in the industrial organization of processing companies are anticipated, based on experiences found in other rationalized fisheries, including possible consolidation, joint ventures, and other arrangements among processors (horizontal integration) and between processors and harvesters (vertical integration).

The qualitative analysis included in this section began with a summary of the market structure developed as a part of Section 3.7. A review was made of changes that have occurred in the market structure experienced in other fisheries that have been rationalized. Finally, a discussion is included of the anticipated changes that may occur in the groundfish processing sector.

Quality of Landings: In addition to, and influenced by, harvest timing and elimination of the derby-style fishery is an improvement in the quality of landed fish. Harvesters have better opportunity to be more selective in harvests, and to manage the harvested fish once on board in such a way as to retain higher quality. The quality could also be affected if the volume of individual landings is reduced. This could lead to generally higher prices received by harvesters, and the effect on motherships could be positive or negative, depending upon the motherships' ability to influence wholesale or retail prices with the higher quality fish. Motherships could also be positively affected if the better quality fish leads to new market opportunities. The analysis addressed these concepts qualitatively.

Processing Costs: In a rationalized fishery, the cost of processing could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if there is more uniform operation during the season or year, with fewer hires and layoffs and less overtime required. Other costs could be affected depending upon ability to open new markets or change operations. However, harvest timing, and associated hires and layoffs, is not likely to change as much within the mothership sector as it would among shoreside processors. A qualitative discussion of these items was conducted.

Product Recovery Yield: A concept related to harvest timing and quality of landings is the positive effect on product recovery yields. Reducing the derby-style fishery can lead to more careful management of the fish that are harvested and less waste. However, the motherships used in the Bering Sea pollock fishery is used in the Pacific whiting fishery. This same capital was streamlined and made more efficient as a result of the American Fisheries Act, and therefore it is unlikely that other than minor improvement in product recovery would occur in the mothership sector.

4.11.2 Broad-level Effects of Rationalization on Mothership Processors

Broad level effects to motherships from rationalization could include changes in bargaining power over exvessel prices, the quality of fish to be handled, and the timing of deliveries, among other things. There were three or four motherships active in the whiting fishery each year from 1998 through 2005, with a new entrant in 2006. (Each of the motherships also processes some non-whiting, but only as bycatch of targeted whiting trips.) The means that a relatively small number of companies process whiting on motherships. However, the final processed products from the motherships enter markets where they compete with similar fish products originating elsewhere in the United States and other countries, and are therefore more competitive in the final processed product market. In other words, mothership processors are generally unable to control market prices for final products.

Harvesters (catcher vessels) and mothership processors are in a dependent relationship, each specializing in certain elements in the supply chain that brings fish to the ultimate consumer. Rationalization will have second-order effects on mothership processors, and the distribution of quota share will have a direct effect on motherships by potentially altering the bargaining power between processors and harvesters over exvessel prices. Assignment of quota shares to harvesters directly increases their bargaining power with processors. IFQs and cooperatives each institute a quasi-permanent harvest privilege assigned to the individual (or cooperating group). Even though the harvest opportunity (quota pounds) must be exercised within the year, the underlying quota share renews the specified opportunity in the next year. IFQ holders even have the ability to sell their quota pounds and realize some gain from the harvest opportunity they do not exercise. This gives harvesters much greater latitude to hold out for better prices because they have a guaranteed harvest opportunity over a longer time period.

IFQ ownership by processors would tend to offset the gains for harvesters, and bring the relationship closer toward status quo negotiation conditions. For example, a processor could use quota shares to induce a harvester that is short of quota pounds for a particular species to make deliveries under specified conditions and prices. At this time it is unclear what balance of processor/harvester quota ownership would achieve status quo conditions.

Two of the scenarios provide a mechanism for harvester coops instead of IFQs, and the establishment of coops would also have a direct effect on motherships in terms of bargaining power. By operating under coops, the harvesters will be managed jointly as one or a few entities, depending upon the number of coops that form. These entities will negotiate with motherships in a sort of "bilateral monopoly," essentially as two strong but countervailing powers. In some respects, the resulting negotiated price outcome is not predictable, as it depends upon the relative skill of the negotiators. However, there is some indication that the motherships and harvester coops may seek to establish a "profit sharing" arrangement, thereby establishing a formulaic manner of setting exvessel prices. In that sense, the harvester-processor relationship can operate almost as a vertically integrated firm.

Under rationalization, harvester quota shares are likely to have a second order effect on processors through several fronts. Fleet consolidation would reduce the number of harvesters, thus lessening the processors' market influence by more closely aligning the number of harvesters with the number of processors. Assignment of up to 50 percent of quota shares to mothership processors is a feature of one scenario. This would have a countervailing effect because, as suggested above, processors could use the quota shares they control as leverage in forging agreements with harvesters. After trawl rationalization, entry of new processors could be more difficult. First, they would have to establish business relationships with harvesters who—other things being equal—may be more inclined to deal with processors with whom they have an existing relationship (but this disadvantage pertains under status quo). They could face a second hurdle if quota shares are initially allocated to existing motherships; to be equally competitive they would need to purchase quota shares, a cost existing processors would avoid by any initial distribution.

An important effect of rationalization on the harvester side is to eliminate Olympic- or derby-style fisheries, because harvesters control an allocation which they may deploy at will. The mothership whiting sector remains a single, common quota-based fishery. With exception of the catcher-processor sector, which operates as a cooperative, the whiting fishery can be described as derby-style. To the degree that rationalization allows catch privileges to be assigned to individual harvesters or cooperatives that coordinate their behavior, landings could be more evenly distributed throughout the season. As a result, both the shore-based and mothership sectors should be expected to engage in operations over a longer time period. Complete flexibility in the timing of landings is mitigated by regulatory measures to limit the bycatch of salmon and vessels' participation in the Alaskan pollock fishery. Chinook salmon bycatch is controlled to a large degree by the May 1 start date; participation in the Alaskan pollock fishery will likely induce at least some participants to leave the fishery before the whiting are no longer available to the fishery in late fall or winter.

Currently, the MS season starts in May and typically lasts about a month, when the motherships depart to participate in the Alaska pollock B season beginning June 10. It is not unreasonable to assume that under rationalization, the MS whiting fishery would turn into two ad-hoc seasons with some effort occurring in May and a second effort occurring in September or October, after the pollock B season and/or shoreside whiting season. This may occur because salmon bycatch increases late in the pollock B season. In addition, literature has shown that the value of whiting increases later in the year. More certainty about autumn fishing opportunities under a rationalized fishery should provide opportunities to capitalize on this value which should influence the timing of the mothership sector. The following figure demonstrates one possible seasonal distribution of mothership activity in a rationalized fishery. This distribution uses the same distribution as currently occurs in the catcher-processor sector, except that it is assumed the mothership participants move to shoreside whiting, or Bering Sea Pollock in July and August, but return in September.

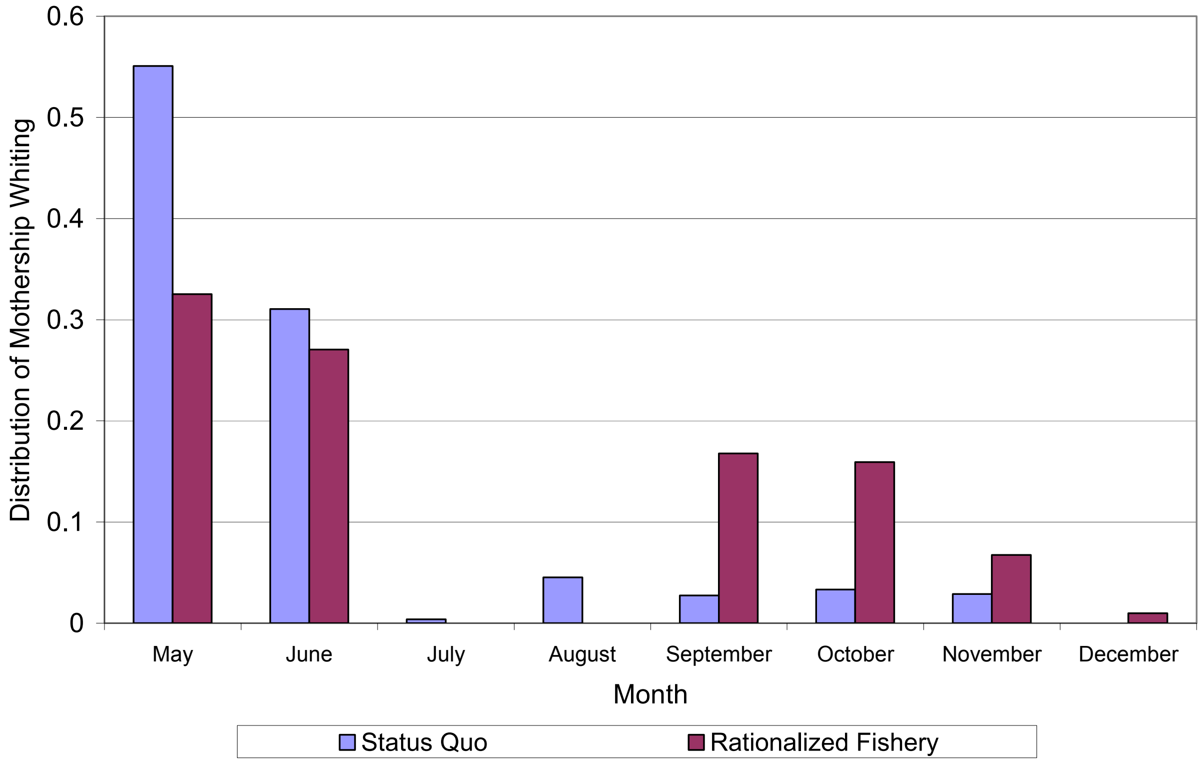


Figure 4–44. Estimated Seasonality of Mothership Whiting Harvests

Rationalization should allow harvesters the opportunity to increase the quality of landed fish, because a more measured pace of fishing will allow more attention to factors affecting quality. This could benefit motherships by assuring a stable, high quality supply, which would make it easier to maintain existing markets and develop new ones. With more stability in catches, harvesters and processors may be able to coordinate to develop new products and markets.

In a rationalized fishery, the cost of processing on motherships could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if the season elongates and fewer motherships may be needed to handle the harvested volume. It is likely that the season will still be compressed to some degree because of constraints within the pollock fishery, the shoreside whiting fishery, and the availability of whiting. Therefore, any mothership engaged in processing operations is likely to be fully engaged, though fewer motherships may be necessary if the season is extended.

Regular supply could also increase product recovery. Although equipment in the mothership sector has been modified by the implementation of the American Fisheries Act in the Bering Sea, rationalization could result in better use of existing capital equipment and labor. Workers could have the opportunity to more carefully cut fish; likewise, equipment could be more easily adjusted to maximize yield. Since whiting is a high volume fishery with a generally highly processed end product, small changes in product recovery yield can lead to a substantial increase in profits. Initial allocation of quota shares to motherships, functioning as a means of guaranteeing supply, could provide an incentive to make further adjustments to increase product recovery.

To the degree that IFQs or cooperatives allow harvesters to time landings and coordinate with processors, rationalization could allow processors to better respond to changing market conditions along with the ability to develop new markets. Markets respond favorably to uniformity and predictability, and stronger guarantees of steady product deliveries could increase market penetration and the building of stronger relationships with retailers. Although this may apply more to nonwhiting than to whiting fisheries, increasing the ability to guarantee supply to retailers could help in development of new markets.

As noted above, a rationalized trawl fishery could create new opportunities leading to a restructuring of the overall processing sector, based on the experiences from other rationalized fisheries. Either through consolidation by direct purchase or joint ventures, integration could increase. This includes both horizontal integration—business arrangements among processors—and vertical integration—arrangements between processors and harvesters. However, if horizontal integration takes place in the mothership sector, it is more likely to include shoreside processors with motherships than consolidation among mothership businesses. This is because certain shoreside processing businesses may be more vulnerable to the effects of rationalization. As discussed in Section 4.15.5, the distribution of non-whiting landings may change across West Coast ports, as a result of harvester consolidation and the comparative advantage of some ports. Some shoreside processors could be negatively affected (if their harvesters move away) or be forced to shut down. This could create diversification opportunities for mothership processors.

An initial allocation of quota shares to processors could stimulate horizontal and/or vertical integration. First, quota shares are likely to encourage consolidation as more efficient firms are willing to buy up quota shares owned by less efficient firms. This could occur among processing firms or processing firms could buy up harvesters' quota shares (and their physical assets, such as vessels) increasing vertical integration. Depending on the availability of capital the converse could occur; more efficient harvesters could buy up processors' quota shares (and/or their physical assets) to vertically integrate. In general, such consolidation or integration would be encouraged by any resulting returns to scale: increased size and integration across a range of operations would serve to reduce overall costs. Joint ventures serve much the same purpose while retaining existing ownership arrangements.

New motherships entering the whiting sector must overcome barriers to entry—a common problem in a sector having a few large firms—such as meeting the considerable capital requirements required to constitute physical plant and cover operating costs (depending on initial cash flow) and competing with existing motherships to establish business relationships with harvesters, which could require paying higher exvessel prices in order to lure harvesters away from their current buyers. Rationalization could make entry easier if potential entrants are able to acquire quota share. They could leverage their quota share to establish relationships with harvesters and have greater assurance of receiving deliveries, which could offset some of the competitive advantage existing firms may possess. This advantage pertains if there is a level playing field in terms of mothership quota share ownership. An initial allocation to existing motherships would likely compound existing barriers to entry because those motherships receiving the initial allocation would not face the same costs (in terms of quota share purchase) as would new entrants.

4.11.3 Effects of the Alternatives Revealed by Analytical Scenario

This section provides an analysis of the direct and indirect effects of the analytical scenarios on mothership processors. It begins with an overview description of the manner in which each of the key elements of the analytical scenarios is expected to impact processors. The details of the analytical scenarios are provided in the remaining subsections, with a comparison to status quo and other analytical scenarios, as appropriate.

4.11.3.1 *Expected Effects of Elements of the Analytical Scenarios on Mothership Processors*

A summary comparison of the key elements of the scenarios is provided below. Each of the analytical scenarios will impact groundfish processors in each of the sectors in different ways. Before considering the impact of the analytical scenarios, we first examine how the elements of the analytical scenarios are expected to impact processors in a general sense. Following this discussion, we examine the impact of each analytical scenario on groundfish processors.

How do IFQs and coops change general operating conditions relative to status quo?

- IFQs are likely to decrease the number of harvester vessels, but they may increase operational flexibility for processors, including motherships, compared to status quo. With greater certainty to harvesters and processors alike that is afforded by QS, processors can better plan and more efficiently utilize their facilities. However, bargaining power for exvessel prices may shift toward harvesters. With harvester coops, the negotiation environment will change to one that may be akin to a bilateral monopoly, with essentially balanced power. The coop also provides an opportunity for mothership owners to establish profit-sharing arrangements with the coop(s), even operating in a vertically-integrated partnership.

- Increased flexibility and control over fish for processing can lead to more uniform timing, better quality of products, higher recovery yield, and possibly decreased operating costs. This is because whiting processing capital is structured to account for larger pulses of fish consistent with conditions in seasonal race for fish; under a quota system, the harvest timing is more controlled, and some capital (i.e., the number of motherships operating at any given time) may not be necessary. This provides opportunities for processors to have lower per unit costs and therefore additional profit.

How does initial allocation of QS to harvesters make things different for processors?

- Consolidation among harvesters will concentrate QS among fewer entities, and as a result decrease the bargaining power for processors relative to status quo.

- Allocating the entire QS to harvesters may allow harvesters to leverage higher prices from motherships. However, many of the relationships that exist between harvesters and processors in the mothership sector appear to be an extension from BSAI pollock operations, meaning exvessel price negotiations may be less driven by whiting allocations and more a function of relations that exist in BSAI pollock.

- Initial allocation of QS could affect some long-term harvester-processor relationships if the distribution of QS results in smaller allocations than status quo levels.

How do processor initial allocations affect processors?

- If processors receive initial allocation of QS, then processors will regain at least some of the bargaining power over exvessel prices lost to harvesters, relative to the case where no initial allocation is made to processors. Processors with initial allocation can vertically integrate and also engage in fish harvesting opportunities to some degree independent of other harvesters. This increases the ability of processors to “hold out” against harvesters while negotiating over exvessel prices.

- Processors will gain increased flexibility for matching catch periods to market demand, and elongating the season for optimal processing efficiency. The mothership sector may evolve into a two-period whiting season. This creates opportunities for lower per unit costs; in combination with expanded market opportunities, this may allow for an increased ability to compete with groundfish providers in the global market.

- If harvesters are affiliated with processors in a cooperative system, the net effect on exvessel prices is not clear. The outcome of prices in this case may depend on personal relationships. In addition, a processor linkage does not decrease the quota available to individual harvesters and therefore does not give processors direct control over harvesting activity.

How will accumulation limits affect processors?

- Accumulation limits generally restrict control and consolidation among processors. A limit on fleet consolidation will tend to restrict economic performance of harvesters, but will also reduce the likelihood for consolidation among mothership companies.

- Control limits also affect the ability of the mothership sector as a whole to increase the amount of quota shares held by motherships. This will have a long-term effect on exvessel prices.

- A restriction on control will tend to limit the degree of influence that the largest processors will have on the program, and therefore affect the distribution of economic performance.

How will a grandfather clause affect processors?

- A grandfather clause tends to have a distributional effect on motherships if they stand to receive an initial allocation of quota share. The current participants have historically been moderate to large producers, and some could stand to gain quota share in excess of the accumulation limits if a grandfather clause is adopted.

- If large processing entities receive quota share in excess of the accumulation limits, this may have an effect on exvessel prices. This is because it creates the potential to have few dominant companies that hold large amounts of quota share.

How does the number of species covered affect processors?

- The number of species covered will affect harvesters directly, and processors indirectly. As the number of species covered in the program increases, harvester flexibility decreases and this may have an effect on the outcome of the program. Species with low OY levels may impose risk to harvesters because of the uncertainty associated with what a vessel will catch while fishing and the cost of going into a deficit condition (see Section 4.7.2.3).

How do the number of trawl sectors influence processors?

- The number of trawl sectors (three or four) is not likely to affect mothership processors, as they would remain in their own sector under any scenario.

How will an adaptive management provision affect processors?

- The adaptive management provision provides a mechanism to mitigate harm to adversely impacted processors or to achieve other objectives as may specified by the Council, such as bycatch reduction or community protection. Awarding adaptive management to adversely impacted mothership companies is likely to have a distributional effect, with some motherships being recipients of that share.

- If processors are awarded an initial allocation and therefore cannot be recipients of adaptive management quota, adaptive management will provide a distributional effect. Much of this effect may be via a second order effect on harvesters. This is because the majority of motherships potentially operating in the fishery under rationalization would, available data indicates, also receive quota. Therefore, if an initial allocation is made to motherships, adaptive management may be provided only to harvesters. Depending on which harvesters receive that adaptive management quota, the motherships that receive those deliveries would stand to gain indirectly.

- Adaptive management could provide a vehicle for entry of new processors, the development of specialty processing opportunities addressing niche markets, or to create goal-oriented processor-harvester arrangements.

How will area management affect processors?

- Area management is not expected to affect motherships, as they are restricted to operating entirely in the northern area.

How will a carry-over affect processors?

- A carry-over provision decreases the cost to harvesters from going into a deficit condition, and therefore decreases the risk associated with harvesting activity. Such a change in risk may mean that harvesters are willing to prosecute target species that are associated with high risk species. This will have a limited secondary effect on motherships.

How will tracking and monitoring affect processors?

- At sea monitoring primarily affects the cost of fishing. It will have only limited effect on processors, except to the extent that harvesters can bid prices received higher to cover added costs. High monitoring costs may also lead to higher levels of fleet consolidation and this may influence processors because of the presence of fewer harvesters to purchase fish from.

4.11.3.2 *Scenario 1 (No Action)*

- Processor Net Revenues

4.11.3.3 *Scenario 2*

The effect of scenario 2 on processor net revenues is unclear. Exvessel prices paid to harvesters are generally expected to increase under this scenario as compared to the status quo, primarily because the majority of the quota is distributed to harvesters. This provides an expectation that costs may increase for motherships. Under a rationalized fishery, the holders of the quota share generally hold the value of the fishery because of their ability to bid away profits from others. However, exvessel price negotiations among motherships and harvesters may be less driven by whiting allocations and more a function of relations that exist in BSAI pollock. On the other hand, it is likely that other factors will lead to increased gross revenues for motherships. Since rationalization provides greater certainty, it is reasonable to expect that mothership operations will occur during the fall months and literature has shown that whiting are more valuable later in the year. Therefore, while motherships may pay higher exvessel prices for whiting to harvesters, the revenue generated from Pacific whiting may increase if fishing activity occurs later in the year. Therefore there is reason to believe that motherships will pay more for acquiring fish from harvesters, but they may also receive more for their finished product. This makes the overall effect on mothership net revenues unclear.

Under this scenario, IFQ are given to harvesters based on catch history. As noted above, this will lead to consolidation among the harvester fleet, and harvesters remaining in the fishery will have a stronger position from which to negotiate (and if necessary, hold out) for exvessel prices without fear of losing harvest opportunities to others. In addition, the fact that the harvesting sector has control over the quota share means that the fishery is more likely to be prosecuted in a manner that benefits harvesters.

Because they would not receive an initial allocation, mothership companies would be worse off under Scenario 2 than Scenarios 3b, 4, or 5. Mothership processors would also be worse off under Scenario 2 than under Scenario 3a, which has a provision for adaptive management that could be used for mitigating effects.

As noted in the harvester section (4.7.2.2), fleet consolidation will take place among whiting vessels. Harvest activities are bounded by resource accessibility and seasonality of other fisheries, particularly Alaska pollock in the North Pacific.

The length of harvesting activity in the harvesting sector is expected to elongate under a rationalized fishery to some degree. This change in the pace of harvesting will tend to increase product quality and therefore increase the value of Pacific whiting harvests. However, since the holders of quota share are able to bid away profits from others, it is likely that harvesters will bid up higher exvessel prices, thus eroding potential gains in profits to motherships that would otherwise occur because of changes in product quality. The elongated season may also require less processing capital being necessary to handle harvest volumes. Such a decrease in processing capital is likely to decrease the per-unit cost associated with processing, thus generating higher profits. However, since harvesters control the majority of quota in this scenario, some or all of those profits are likely to be bid away from the mothership sector toward the harvesting sector in the short run.

The negotiation power over exvessel prices may shift from motherships to harvesters, at least in the short run, in Scenario 2 relative to status quo. Over the long term, however, motherships may be able to acquire enough Pacific whiting quota to influence exvessel prices. In addition, under the initial allocation provision, some processing entities will receive an initial allocation of quota because they own limited entry trawl permits.

4.11.3.4 *Scenario 3*

Many of the provisions under Scenario 3 are similar to those of Scenario 2, but Scenario 3 is specifically designed to compare two methods for addressing processor concerns. One method (Scenario 3a) provides that an adaptive management provision be available and used to mitigate against adverse impacts to mothership companies.[35] Such a program is likely to benefit those companies that are

[35] As noted in a previous section, the suite of alternatives allows the adaptive management provision to be used for things other than for processor concerns such as to mitigate against the effects on adversely impacted communities, and to provide incentives to use habitat- and bycatch-friendly gear

recipients of this quota, although it may not yield the most efficient outcome in terms of national economic development gains expected from rationalization.

The second method (Scenario 3b) provides for an initial distribution of quota shares to motherships, including 50 percent of whiting QS. This scenario will have a distinctly positive effect on motherships relative to Scenario 2 in terms of their bargaining power over exvessel prices. Harvesters with QS will gain bargaining power because of their holdings of quota share, but also through fleet consolidation. Such fleet consolidation limits the number of vessels that can negotiate with mothership companies, and therefore limits the ability of motherships to shop around for harvesters willing to fish at lower exvessel prices. The fact that motherships begin with some initial allocation means that they can vertically integrate and also engage in fish harvesting opportunities to some degree independent of other harvesters. This increases the ability of mothership processors to “hold out” against harvesters while negotiating over exvessel prices. It is almost certain that the ability for mothership processors to negotiate lower prices increases as their ownership of quota increases; however, it is not certain whether the initial allocation options that grant quota to motherships will increase or decrease their negotiation stance relative to status quo.

In general, those holding quota shares experience more certainty about the future than those entities that do not. This increased certainty provides for better business planning in the long term, particularly in relation to the seasons of the other fisheries in which motherships participate. This greater degree of certainty can be expected to lead to greater degrees of reinvestment into fishing and/or processing related capital equipment and technology. This is because enhanced certainty makes profit expectations – and the ability to pay back loans taken for investments – more certain. Over time, the reinvestment of financial capital back into fishery related industries may very well improve the overall economic status of fishing related industries since such reinvestment will be driven by the expectation of profits associated with that reinvestment. Those entities that do not hold quota shares are less likely to reinvest into fishery related activities, and the result may be deterioration in the status of equipment used by those entities. Such an outcome was observed in the Russian Far East where quota shares were auctioned off. The result was a serious deterioration in the economic situation of fishing enterprise (Anferova, et al., 2004). Although auctions work differently than quota shares that are initially allocated over the long term (and therefore the outcomes may be quite different), the perspective of an entity engaged in purchasing quota through an auction is inherently shorter term than an entity that owns quota share. In a program where quota shares are intended to be long term, those entities that do not hold quota shares are likely to have a greater degree of uncertainty about the future than those entities that do hold quota shares. Therefore, if processing companies do not hold quota shares the level of reinvestment is likely to be smaller than if they do hold quota shares. Furthermore, the level of reinvestment made by each entity is likely to be correlated with the level of quota share held by each entity.

An adaptive management provision may place downward pressure on exvessel prices. If used as envisioned, such an adaptive management program will tend to place emphasis on certain (disadvantaged) mothership companies. However, this is true only if harvesters are prosecuting whiting subject to adaptive management, which comprises ten percent of the QS. A limit on the number of potential buyers may have a downward effect on prices paid for the adaptive management fish. However, the adaptive management provision is not likely to impact exvessel prices to the same degree as initial QS to motherships, simply by virtue of the difference in volume attributed to motherships.

Over the long run, mothership companies may continue purchasing quota shares in the whiting sector because of the relatively large size of the control limit. The 25 percent control limit specified for both the shoreside and mothership whiting sectors means that four entities could theoretically control the harvest of whiting in both sectors. This means that over time, exvessel prices in the shoreside whiting sector may fall to some degree since mothership companies have the ability to acquire additional quota.

If processors are allocated initial QS (Scenario 3b), they may play a greater role in directing the timing of harvests, since they could enter into harvest contracts that include strategic delivery times. In addition, initial allocation of QS to processors could enhance their ability to create joint ventures or other arrangements among processors (horizontal integration) and between processors and harvesters (vertical integration).

4.11.3.5 *Scenario 4*

The elements of Scenario 4 for the mothership whiting fishery differ considerably from Scenarios 2 and 3, in that harvest cooperatives are established. The major effect on motherships is primarily in terms of the negotiating relationship over exvessel prices. With a harvester cooperative, the fishery could behave as a "bilateral monopoly," with a small number of reasonably balanced buyers and sellers. Processor-harvester affiliations, also an element of Scenario 4, reinforce the characteristics of this relationship. Under this condition, the effect on bargaining position and the change in exvessel prices can not be predicted, as it largely rests upon personal relationships and the bargaining skill of the negotiators. As noted above, the whiting exvessel price negotiation may be a function of relationships established between motherships and harvesters on a number of fisheries, including BSAI pollock.

Scenario 4 features an adaptive management provision. The adaptive management provision could be used to mitigate adverse impacts to mothership companies or communities. It could also be used to encourage gear switching or the development of gear with lower bycatch. Depending upon the objective of those administering the quota, the distribution of effects is likely to vary.

An adaptive management provision may place downward pressure on exvessel prices. However, this is only true if harvesters are prosecuting groundfish subject to adaptive management, which comprises 10 percent of the QS. A limit on the number of potential buyers may have a downward effect on prices paid for the adaptive management fish.

The relationship between harvesters and motherships that is formed through coops for harvesters in this scenario is different from the relationship established by issuing both sectors IFQ, as in Scenarios 3b. The exvessel prices that result through a harvester-processor affiliation (linkage) in the mothership sector could be different from the negotiated exvessel prices when both harvesters and motherships receive IFQ. While harvesters and motherships that both receive IFQ are not limited to whom they can buy and sell, harvesters and motherships in a cooperative structure with a linkage are contractually bound (though the linkage can be broken with some effort). This linkage means that negotiation and relationships that exist between the harvester and motherships could have some influence over exvessel prices in the short term, as opposed to a market-driven outcome. Over the long term, harvesters and motherships can break that arrangement if the harvester fishes in the "non-cooperative" portion of the fishery, though this fishery is a competitive, derby-style fishery which makes it unattractive and arguably less profitable. Though there is incentive to break the linkage and seek higher prices elsewhere, doing so may be costly.

The distribution of harvest opportunities under a cooperative structure with harvester-processor linkages is in many respects more similar to Scenario 2, with 100 percent of the initial allocation going to permits, than for Scenario 3b where an initial allocation is made to both harvesters and motherships. This is because under a cooperative system with processor linkages, the harvester still controls the opportunity to harvest the available quantity. That quantity is not made available to processors, as would be the case if IFQ was allocated to motherships.

4.11.3.6 *Scenario 5*

The elements in Scenario 5 reflect some features of each of Scenarios 2, 3, and 4. Scenario 5 differs primarily in the results of the initial allocation formula, the presence of a grandfather clause, and the lack of an initial allocation to motherships but a 50 percent affiliation of whiting. Other elements of this scenario differ, but do not appear to have a noticeable effect on the outcome.

Scenario 5 has a 50 percent affiliation with harvesters, in contrast to the 100 percent affiliation in the Scenario 4. This creates some disadvantage in terms to motherships of exvessel prices in this scenario, because harvesters have an opportunity to seek better pricing arrangements for half their quota, rather than being tied to a single mothership. However, because it appears that relationships in the mothership sector are often extensions of relationships that exist in Bering Sea Pollock, the level of affiliation may not have a large effect on many mothership-catcher vessel relationships. However, because there are relationships between motherships and catcher vessels that do appear to be independent of Pollock relations, a lesser degree of processor affiliation will tend to disadvantage motherships in those negotiations relative to scenario 4.

4.11.3.7 *Comparative Summary of the Effects of the Analytical Scenarios*

Scenario 1	• Continued status of overcapitalization as a result of short season
Scenario 2	• Higher cost of purchasing fish from harvesters compared to status quo • Potentially lower cost of production as a result of season extension
Scenario 3a	• Select, adversely impacted processors receive quota through adaptive management, minimizing disruption of activity • Processors that are not recipients of adaptive management may be affected similarly to scenario 2 • Potentially lower cost of production as a result of season extension
Scenario 3b	• Motherships pay lower prices for fish from harvesters than in scenario 2 • Potentially lower cost of production as a result of season extension
Scenario 4	• Motherships may pay lower prices for fish than in scenario 2, or may enter into profit sharing arrangements with harvesters • Potentially lower cost of production as a result of season extension
Scenario 5	• Motherships may pay lower prices for whiting than scenario 2 and 3a. Some motherships may pay higher prices for whiting from some catcher vessels • Potentially lower cost of production as a result of season extension

4.12 Impacts to Trawl Catcher Processors

Rationalization is only expected to result in minor changes to the catcher-processor sector, if at all. Rationalization may increase the certainty that catcher-processor participants have over fishing opportunities, however, because this sector currently acts like a rationalized fishery through the formation of the voluntary harvest cooperative, substantial changes are not expected to occur in this fishery. Some impacts, however, may occur. Establishing a system of IFQs may alter the harvest opportunities for companies currently engaged in the sector. Available data indicates one company may see less opportunity while others may see more if IFQs are granted based on the existing allocation formula. In addition, if sector or cooperative level bycatch limits are specified in a cooperative-based fishery, the certainty that participants in this sector have over fishing opportunities will tend to be greater compared to a case where a common bycatch limit is established for the three non-tribal whiting sectors.

In this section we describe the impacts of rationalization on catcher-processors of Pacific whiting. This group is comprised of participants that both harvest and process Pacific whiting onboard the same platform and that hold limited entry trawl permits to do so. At least one company also participates in the mothership sector with a different vessel. Those operations are covered under the section describing impacts to motherships.

The section begins with a description of methods used to assess effects on catcher-processors and the metrics used to illustrate those effects. The variables and metrics used, some of which are also used in earlier sections, can be compared and contrasted among the analytical scenarios. The broad-level effects of rationalization on catcher-processors are presented next, and contain a discussion of important general issues associated with rationalizing the fishery.

Following the description of broad-level effects, we assess the impacts on catcher-processors of the analytical scenarios. This section begins by identifying the impacts that are expected to occur from each of the elements of the scenarios independently. We then provide an assessment of each analytical scenario on catcher-processors. At the end of this section we provide a comparative summary that is intended to be a side-by-side comparison of the effects of each analytical scenario on groundfish trawl harvesters.

Finally, we assess cumulative effects of rationalization on catcher-processors. This cumulative effects section briefly summarizes the past and present actions with ongoing effects on catcher-processors, and the reasonably foreseeable future actions that are anticipated to have effects. The combined effect of these past, present, and reasonably foreseeable future actions are merged with the effect of the analytical scenarios to arrive at the cumulative effect.

4.12.1 Methods for Assessing Impacts

Table 4-30. Overview of analytical approach used to compare baseline and future conditions of trawl catcher processors under the alternatives.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods Used for Assessing Impacts
Changes in vessel profits and fleet efficiency	Fleet consolidation	Number of active vessels	Analysts assessment of fleet consolidation
		Fleet-wide costs	
	Distribution of harvest privileges	Number of initial QS recipients	Model of the effects of initial allocation of IFQ
		Exvessel value of QPs allocated to participants	
	Pace and location of harvesting	Length of season	Capacity analysis and timing of resource accessibility
		Geographic distribution of fishing effort	Analysts assessment of geographic shifts in fishing effort
	Flexibility in harvest timing	Opportunities for modifying harvest timing	Qualitative assessment
	Monitoring costs	Cost borne by trawl catcher-vessels to meet monitoring requirements	NMFS research on tracking and monitoring programs
	Harvesting costs	Annual cost of harvesting activity	Analysts assessment of harvesting costs
	Ability to conduct business planning	Relative certainty over future fishing opportunities	Qualitative assessment
Individual and collective harvesting risk	Likelihood of catch events that are greater than quota pounds	Relative risk to harvesters of exceeding quota pounds	Qualitative assessment
	Cost of covering deficits	Availability of quota for covering deficits	Qualitative assessment
	Risk associated with the presence of thin market conditions	Risk posed by trading quota in volatile markets	Qualitative assessment
Changes in fishing vessel safety	Fleet size; vessel operational flexibility; and financial ability to invest in vessel maintenance and safety equipment	Occurrence of safety-related incidents	Qualitative assessment based on literature and expertise of analysts

4.12.2 Broad-Level Effects of Rationalization on Catcher Processors

In general, catcher-processors are expected to be directly affected by rationalization through the harvesting aspect of their operations. This is opposed to the processing aspect of their operations. The reason catcher-processors are impacted through the harvesting aspect of their operations is because the alternatives being contemplated for the catcher-processor sector influence the manner in which harvesting privileges are issued and managed. Processing operations on board catcher processors may be influenced from changes in harvesting operations, but in the end any effect still occurs on board the catcher-processor vessel. For this reason, many of the effects of rationalization described under the section on limited entry trawl harvesters are applicable to catcher-processors.

Some effects may be felt in the catcher-processor sector due to a handful of key factors. These key factors include: whether to issue IFQ or establish a framework for continued voluntary coop formation;

whether to manage bycatch limits at the coop, sector, or fishery-wide level; and (if IFQ is issued) whether to manage all species in the ABC/OY table with quota, or whether to manage a subset of those species with quota. In addition, an adaptive management provision may have some impacts on the performance of the C-P sector. Other elements of the analytical scenarios are not expected to have an effect on the performance of the sector. These other elements include the initial allocation formula if an IFQ program is selected, accumulation limits, grandfather clause, the number of trawl sectors, and area management.

4.12.2.1 *Changes in Profit and Fleet Consolidation*

The existence of the voluntary catcher-processor cooperative has led to conditions in the catcher-processor sector that resemble a rationalized fishery. Because of this, further changes in the profitability of entities in this sector as a result of rationalization are not expected. In addition, further fleet consolidation, changes in the pace and location of harvesting, and changes in the flexibility of harvest timing are not expected because these factors have already changed as a result of the voluntary cooperative. In addition, rationalization is not expected to result in modifications to the level and cost of monitoring that is currently on-board catcher processors. As each catcher-processor currently carries two at-sea observers, it is not envisioned that additional coverage will be necessary. Therefore, costs borne by participants in the catcher processor sector to meet at-sea observer requirements are not expected to change.

The formation of the voluntary catcher-processor cooperative led to consolidation in the amount of effort in the catcher-processor sector, an increase in the length of the season, and increased communication over – and performance in – bycatch reduction. All of these outcomes are typical of rationalization programs.

The following figure illustrates the change in seasonality of catcher-processor whiting harvests before and after the formation of the voluntary cooperative. As indicated in the figure, the season has spread out substantially since the formation of the cooperative with substantial portions of the harvest occurring from August to November whereas little harvest occurred during this period prior to the formation of the cooperative. Though not shown in the figure, also occurring was a decrease in the number of vessels used to harvest the available whiting resource. Prior to the formation of the cooperative, 9 vessels per year were engaged in the harvesting of whiting on average, while after the formation of the cooperative 6.8 vessels per year were engaged in the harvesting of whiting on average.

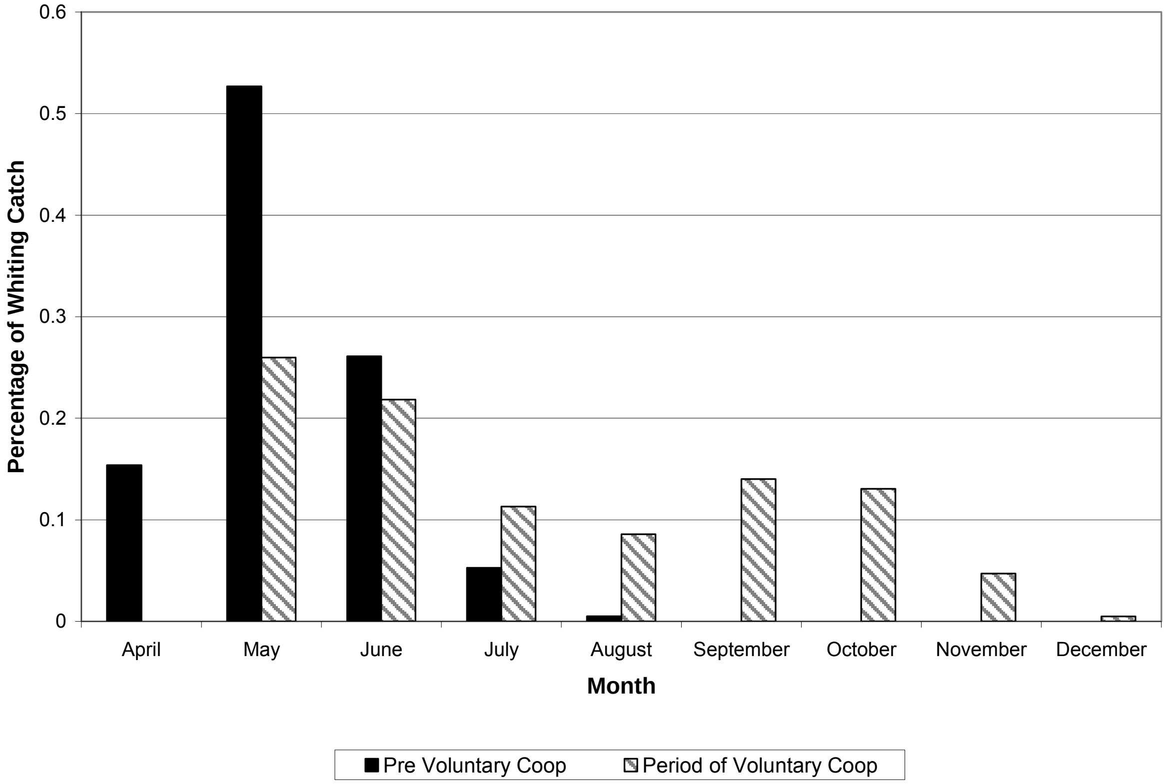


Figure 4–45. Seasonality of whiting harvest in the catcher-processor sector (before and after formation of voluntary cooperative).

One factor that is related to profitability and fleet consolidation, however, is the possibility of other fishery sectors influencing the opportunities catcher-processors have over fishing activity. If bycatch limits are specified in such a way that they are common to all three non-tribal whiting sectors, then the actions of harvesters in one sector can impact the opportunities in another. Under these conditions, incentives exist to engage in race-for-fish behavior because of bycatch, and profitability under race for fish conditions would decrease.

The likelihood of catcher-processors engaging in race for fish behavior, therefore reducing profitability and increasing the number of vessels in the fishery, depends on whether participants in the catcher-processor sector believe they can successfully prosecute the fishery. The section describing "risk" outlines this concept and its effects on profitability and fleet consolidation in more detail.

4.12.2.2 *Individual and Collective Harvesting Risk*

As outlined under the section describing impacts on limited entry trawl harvesters, catcher-processors may face a variety of risks that can impact the outcome of the program. Several sources of risk are possible including those that place risks on the individual and those that pose risks collectively across all participants in the sector. The discussion of this risk is described under the section describing impacts to limited entry trawl harvesters. The reader is referred to that section for more detail, however the effects are summarized below.

If an IFQ program is implemented, individual risks may exist if participants are held accountable and responsible for their catch of certain species. This is because of the uncertainty associated with fishing, and the fact that accidentally exceeding one's holding of quota – and trying to cover that deficit by purchasing quota – could be costly depending on the species. If species such as overfished species, nearshore rockfish species, and flatfish are allocated to the catcher-processor sector in quantities that are similar to status quo harvests, then individuals may need to incur substantial costs if encountering more catch than expected.

Another source of risk in an IFQ-based program comes from the concept of "thin markets". A "thin market" for IFQ could occur when allocations of some groundfish species are so small that there are a very limited number of suppliers. Such conditions often lead to volatile price fluctuations (of quota in this case) and quota transactions that involve strategic behavior. The effect of thin market situations can create cases where the market is not able to reach equilibrium and transfers occur based on mechanisms other than market mechanisms (such as personal relationships). In addition, thin market conditions are related to the risk posed by individual accountability. Thin markets may make it problematic for vessels to actually find quota to cover catch deficits, and this poses a financial risk to harvesters. The species for which thin markets may exist in the whiting fishery are covered under the section describing impacts to limited entry trawl harvesters.

Collective risks exist to catcher-processors if bycatch is managed as a pool. There are three options for managing bycatch in addition to allocating IFQ which include managing bycatch at the cooperative level, managing bycatch at the sector level, and managing bycatch at the fishery level (across the three non-tribal sectors). Since the catcher-processor sector is made up of one voluntary cooperative, it is assumed that managing bycatch at the sector and cooperative level would result in the same effect on this sector. Therefore, only two levels of bycatch management are examined which are different that IFQ.

In a co-op program, the type of individual risk described above is minimized through collective management that spreads the risk across the multiple participants in the co-op or fishery. However, if the risk is spread across too many participants, the ability of those participants to agree to a bycatch management plan may be jeopardized and there is a potential for a "race for bycatch" to develop among harvesters.[36] The risk that a race for bycatch may develop depends on the number of co-ops or sectors that a bycatch limit applies to. If a bycatch limit is applied to a relatively small pool of vessels (e.g., to individual co-ops) the possibility of a race for bycatch developing is relatively small. Conversely, if a bycatch limit is applied at a relatively gross level (to all three commercial whiting sectors combined), it is much more likely that a race for bycatch would develop. Under these conditions, the profitability currently seen in the sector, and generally expected under rationalization, would likely be compromised. Racing for bycatch would entail the same outcome as a race for target species with more vessels participating than necessary, a shorter season than currently exists, and an otherwise lower degree of profitability in the sector than would otherwise be expected.

4.12.2.3 *Safety*

Fishing vessel safety is generally associated with the ability of vessels to maintain equipment and with the flexibility vessels have in avoiding adverse weather conditions. Under rationalized fishery conditions profit per vessel is typically expected to improve, leading to better maintenance of equipment on-board vessels. However, since the catcher-processor sector already acts like a rationalized fishery, increases in profitability and maintenance is generally not expected to occur. In addition, since the

[36] The term "race for bycatch" is used in this case to describe a type of behavior that occurs when harvesters do not believe that the bycatch limit will be successfully managed. In this event, harvesters believe that they face the risk of being preempted by the attainment of a bycatch limit and therefore race for fish in order to harvest their allocated target species.

sector already acts as a rationalized fishery, the need to fish during periods of adverse weather conditions in order to compete with other participants in the sector does not exist. Therefore, rationalizing the fishery is not expected to result in a change in the timing of harvests. The risk factors described above can have an effect on safety however. If participants race for bycatch, profitability may decline and participants may feel the need to fish in adverse conditions (though the size of most catcher-processor vessels may make fishing in inclement weather a non-issue). Such changes may reduce maintenance on vessels and result in less safe conditions than under a rationalized fishery where there is no incentive to race for bycatch.

4.12.3 Effects of the Alternatives Revealed by Analytical Scenario

In addition to the general effects described above, each of the analytical scenarios is expected to impact catcher-processors is slightly different ways. These differences in the analytical scenarios exist because of variations in the elements that make up each scenario. This section analyzes the direct and indirect impacts of the analytical scenarios on catcher-processors.

In this section we begin by summarizing the effect of elements of the scenarios on catcher-processors. This description serves as an introductory piece of analysis and overview to the way in which the elements of the alternatives will impact this particular environmental component. Immediately following the overview of the elements of the analytical scenarios is a description of the impacts of each analytical scenario. The description of the effects of the analytical scenarios is categorized into two pieces with one grouping being made up of scenarios 2 and 3, and another being made up of scenarios 4 and 5. Because of their structure, scenarios 2 and 3 are expected to result in the same outcome on catcher processors. Scenarios 4 and 5 are expected to result in highly similar outcomes except for variations in one particular element. The effect of this element is identified, but scenarios 4 and 5 are aggregated nonetheless.

4.12.3.1 *Expected Effects of Elements of the Analytical Scenarios on Catcher-Processors*

The effect of the analytical scenarios on catcher-processors is evaluated in two ways. First, we evaluate the specific elements, or program features, that are varied across the analytical scenarios. Second, the entirety of each analytical scenario is evaluated for its effects.

How do IFQs and co-ops change things relative to status quo for catcher-processors?

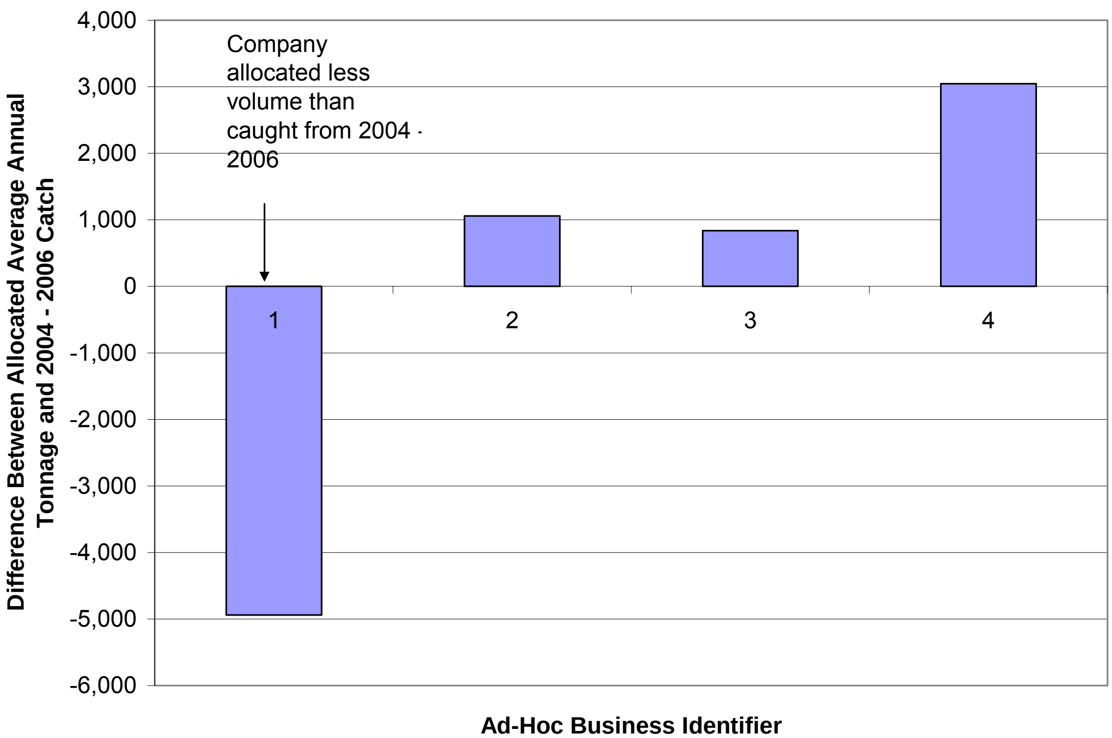
Catcher processors may be affected by whether IFQ is issued to them or whether a limited entry system is put in place as a means of maintaining the voluntary cooperative. While establishing a limited entry system for catcher-processors is expected to result in a continuation of the voluntary cooperative, it is not readily apparent that this system could be defined as a LAPP program. This is because there is no specific action being taken by the Council to issue harvest privileges to individual entities under the catcher-processor cooperative alternative. However, the option to issue IFQ to catcher-processors is certainly a LAPP program. The implication of the cooperative alternative not being a LAPP means that cost recovery for funding a rationalization program may not apply to the catcher-processor sector. Therefore, costs associated with the cooperative alternative may be less for catcher processors than if an IFQ system is put in place.

In addition, cooperative formation may have slightly different outcomes than an IFQ program. One reason for the differences is the relationships that develop among fishery participants in cooperative programs compared to IFQ programs. As discussed in earlier sections, cooperatives rely on close knit relations and communication for success, while IFQs focus on a more individual perspective and therefore may rely less on relationships. Such relations, or lack thereof, may have an effect on how participants prosecute the fishery. For example, close knit relations and communication may result in a different response time in the aggregate when the fleet is encountering bycatch, compared to a fishery where participants are more independent and may communicate somewhat less.

Finally, issuing IFQ may lead to the termination of the existing voluntary cooperative because it may not be necessary for prosecuting the fishery under an IFQ-based program. It is not immediately clear what the implication of terminating this cooperative would entail.

How does initial allocation affect catcher-processors?

The initial allocation of quota shares to catcher-processors may alter the harvest arrangements that currently exist under status quo opportunities. The following figure illustrates the difference between average metric tonnage taken per catcher-processor business entity, and the tonnage that would have been allocated to each entity during that period if an IFQ program was implemented based on the initial allocation formula specified. The following figure illustrates the outcome of the initial allocation formula relative to the harvest quantities made by each entity over the 2004 – 2006 period. These figures assume the same volume taken from 2004 – 2006 would be taken in an IFQ-based fishery. This information shows that one company may be allocated less annual harvest volume than was harvested on average from 2004 – 2006. Three other companies would be allocated more than harvested during that period.



How will the species covered through the program affect catcher-processors?

The species directly managed in the catcher-processor sector will also have an impact on the outcome of the program. As illustrated in Section 4.7.2.3 several types of species may constrain harvest activities in the catcher-processor sector if managed directly with IFQ. While the list of species that may constrain harvest activities is not repeated here, in general requiring that participants in the catcher-processor sector cover their catch of flatfish and nearshore rockfish with IFQ may prove to be equally burdensome as requiring that overfished species be managed with IFQ. This assumes that the allocation to the sector of these species would be on the same order of magnitude as current catch levels. The implication of covering flatfish and nearshore rockfish species with IFQ is that participants in the sector may need to incur a substantial cost by purchasing quota if inadvertently encountering these stocks and going into a deficit condition. Because of the small quantities allocated to the sector, quota for these species may be difficult to acquire, and in the worst case scenario a catcher-processor may not be able to acquire quota of these species even if they have funds to do so, simply because that quota may not be available.

One factor that may influence the success of the C-P sector is the way in which bycatch is managed. Managing bycatch across all three whiting sectors can induce race for fish conditions because of a race for bycatch. While the C-P sector has effectively operated as a rationalized fishery sector with the common bycatch limit present under status quo, increasing concern over the common bycatch limit has been expressed through public testimony at Council meetings since the premature closure of the whiting fishery in 2007 as a result of bycatch. The potential for a race for fish because of bycatch occurring likely depends on the size of the bycatch limits relative to the size of the whiting tonnage allocated to the catcher-processor sector. If catcher-processors believe that it's likely they can take their allocation without being preempted by the attainment of a bycatch limit, then they are likely to continue fishing in a rational, paced manner that is similar to the manner exhibited since the formation of the voluntary cooperative. It should be noted however, that if a rationalization program is put in place with bycatch limits that are common to the three whiting sectors, then the outcome for the catcher-processor sector is likely to be same or highly similar as under the status quo management system.

How will an adaptive management provision affect catcher-processors?

An adaptive management program may impact the catcher-processor sector by redistributing a portion of the catcher-processor allocation to particular vessels. The actual impact of an adaptive management provision on the catcher-processor sector ultimately depends on the objectives of the adaptive management program and the way in which the adaptive management quota is used. Several potential objectives have been discussed including: using the adaptive management quota for community protection; using adaptive management quota to assist adversely impacted processors; and using adaptive management for salmon and overfished species bycatch reduction. In the catcher-processor sector, it is unclear how the adaptive management quota would be used to achieve community protection and to protect adversely impacted processors. Since catcher-processors are not associated with particular ports – except perhaps those in the Puget Sound region – it is unclear what using adaptive management quota for community protection would achieve. The same is true for mitigating against adverse impacts to processors since the processing associated with the C-P sector is vertically integrated into the same platform as the harvesting. Using the adaptive management program for overfished species and salmon bycatch reduction may have an effect, however. There are several potential ways of using adaptive management quota for facilitating bycatch reduction. A benchmark could be set, for example, that grants quota from the adaptive management program to individual vessels if they bring their bycatch rate below a certain level. Another method of using the adaptive management quota could be to grant adaptive management quota to vessels that propose the testing of new gears for exploring bycatch reduction. In either case, the use of an adaptive management program is likely to have a distributional effect where certain participants are recipients of the adaptive management quota and other participants are not.

How will the other program elements affect catcher-processors?

Other elements are not likely to have a noticeable effect on catcher-processors. The accumulation limits specified for the catcher-processor IFQ alternative would allow for 2 vessels to harvest the entire sector allocation and the control limits could allow for 2 companies to own the entire quota. Both cases are substantially more per vessel and entity compared to status quo, which operates as a rationalized fishery. Therefore these accumulation limits are not expected to be restrictive. The presence of a grandfather clause is not expected to have an effect on the performance of the catcher-processor sector because the accumulation limits are relatively large, making a grandfather clause irrelevant. The number of trawl sectors specified for the program is not expected to impact catcher-processors because neither the three or four sector alternative impacts catcher-processors sector directly (both scenarios only contemplate a differentiation or aggregation of the two shoreside sectors). If, however, the three sector alternative means that the shoreside whiting sector shares bycatch quota with the non-whiting sector, then this may reduce the overall pool of bycatch available to the at-sea sectors if bycatch management is being contemplated as a common, three sector pool.

4.12.3.2 *Scenario 1 (No Action)*

- Vessel profits
- Fishing vessel safety
- Economic efficiency
- Crew conditions

4.12.3.3 *Scenario 2 and 3*

Effect of scenario 2 and 3 on vessel profits and fleet efficiency

Scenarios 2 and 3 issue IFQ to catcher processors. The number of entities receiving IFQ under this option is 4 and those 4 entities have collectively used 9 catcher-processing vessels to generate the catch history that IFQ would be based upon. The largest entity would receive less than the control limits, meaning the control limits are not expected to constrain any business entities. For confidentiality purposes, the actual estimate of quota distributed to each entity is not illustrated. The fact that the largest entity is apparently expected to receive less than the control limit makes the presence of a grandfather clause irrelevant.

The issuing of IFQ is not expected to substantially affect profitability in the catcher-processor sector. The issuance of IFQ may result in the termination of the voluntary cooperative and this could have some effects on profitability of there are existing profit sharing arrangements, however it is not immediately clear whether those arrangements do indeed exist and whether such arrangements would change if the cooperative was terminated.

The risk to profits posed by scenarios 2 and 3

The fact that individual entities are allocated quota means that the risk of a race for bycatch developing is minimal. Some circumstances may exist which could lead to a race for bycatch which were described previously. These circumstances include the possibility of a disaster tow by a catcher-processor which is large enough to close the entire sector. The fact that bycatch encounters are sometimes large and unexpected means that the possibility of this disaster tow event exists. However, the individual accountability associated with individual quota increases the risk to each catcher-processor, and the burden they must bear for encountering large amounts of non-target species. Therefore issuing IFQ is likely to encourage behavior that is substantially risk averse, decreasing the possibilities of a disaster tow occurring, but potentially increasing the financial burden individual catcher-processors must bear from encountering higher than expected amounts of bycatch species.

All groundfish species and Pacific halibut are covered with IFQ under scenario 2 and 3. This poses risks to individual participants in the catcher-processor sector because of the inexact method of extracting fishery resources and the fact that many of these species are likely to be allocated to the catcher-processor sector at quantities that are very small. In general, increasing the number of species covered in the program increases the level of accountability, but also can reduce flexibility and impose risk. However, the imposition of risk on harvesters is one mechanism that results in many of the desired outcomes of rationalization, and therefore risk is not necessarily adverse. However, the risk and constraints catcher-processor participants face under scenario 2 and 3 is substantially greater than status quo, where status quo operates as a rationalized fishery. The fact that participants in the catcher-processor sector would be responsible and accountable for approximately 40 species means a ten-fold increase in the number of species participants in the sector must successfully manage. Assuming many of these species (flatfish, nearshore rockfish, overfished species) are allocated at small quantities means an increase in the number of species which may prematurely close the fishery if inadvertently caught in sufficient quantities.

One potential method of managing constraining bycatch species in an IFQ program is through the voluntary formation of “risk pools” or voluntary arrangements formed by participants for sharing risk. Such pools rely on the collective negotiation of bycatch management terms and terms for sharing quota among participants as necessary. These negotiations rely on there being a similar set of objectives and relatively balanced negotiation power. Factors influencing the successful formation and maintenance of these “risk pools” include the manner in which constraining species are allocated to catcher-processor participants. If those constraining species are allocated equally, or on a pro-rata basis to their whiting allocation, then the ability to voluntarily form and maintain risk pools may be greater than if constraining species was allocated less equally.

Effect of scenario 2 and 3 on safety

Scenarios 2 and 3 are not expected to have a noticeable effect, if any, on vessel safety. Because scenarios 2 and 3 are generally not expected to result in race for fish conditions, nor are they expected to decrease revenues compared to status quo, there do not appear to be mechanisms for adversely impacting safety conditions.

4.12.3.4 *Scenario 4 and 5*

Effect of scenario 4 and 5 on vessel profits and fleet efficiency

The effect of scenarios 4 and 5 are likely to result in the same level of profit and fleet efficiency as under status quo, where status quo operates as a rationalized fishery because of the voluntary cooperative. The limited entry system established for catcher-processors under these scenarios creates a framework that protects the existing cooperative from new entry and thereby makes the possibility of a new entrant disrupting the operation of the existing cooperative unlikely. It may be possible for a new participant to purchase a limited entry permit for the catcher-processor sector and enter the sector, and if that is the case there is a possibility that the new participant may not join the cooperative. Alternatively, if an existing catcher-processor sector participant decides to leave the cooperative, it is possible that participants in the sector may begin to fish competitively. The likelihood of these events occurring is not known. However, the establishment of a limited entry system for catcher-processors increases the likelihood that the catcher-processor sector will remain a voluntary cooperative compared to a case where there is no catcher-processor limited entry. Therefore, while there is some possibility that events could occur which could disrupt the existing cooperative or lead to it's termination, the possibility of cooperative disruption or termination is less with a limited entry system in place. Because of these reasons, profits and fleet efficiency should be expected to be equivalent to status quo conditions, with more certainty that the existing level of profitability will continue to be in place. However, certain factors may jeopardize the profits that participants in this sector currently realize. These factors are discussed below.

The risk to profits posed by scenarios 4 and 5

The risk that participants in the catcher-processor sector face under scenarios 4 and 5 are largely a function of how bycatch is managed. Under scenario 4, bycatch is managed in common across all three non-tribal whiting sectors. Under scenario 5, bycatch is managed down to the cooperative level. Since the catcher-processor sector is expected to remain as a single voluntary cooperative under scenarios 4 and 5, bycatch management at the cooperative level is assumed to be the equivalent of managing bycatch at the sector level. In other words, the catcher processor sector is assumed to be managed under a single bycatch limit under scenario 5.

The risk faced by participants in the catcher-processor sector is different between scenarios 4 and 5. The risk faced by participants in the catcher-processor sector under scenario 4 is the risk that all three non-tribal whiting sectors will engage in race for bycatch behavior. This may occur if participants across the three sectors cannot agree to bycatch management terms and it appears unlikely that the whiting allocations can be reached prior to the attainment of a bycatch limit. Under this condition, incentives exist for a race for fish to occur because of bycatch. Under this outcome, participation in the catcher-processor sector may increase relative to status quo and harvest activity is likely to become concentrated toward earlier months – similar to the pattern exhibited prior to the formation of the voluntary cooperative.

The risk faced by participants in the catcher-processor sector under scenario 5 is different in that other sectors are unlikely to affect the harvest opportunities of participants in the catcher-processor sector. It is more likely, however, that participants in the catcher-processor sector will have the ability to preempt harvest opportunities for others in that sector. If one catcher-processor catches an unexpectedly large amount of bycatch species, it is less likely that the sector or coop level bycatch limit will be large enough to cover that large catch event. This depends, however, on the magnitude of that catch event relative to the size of the bycatch limit. If this event occurs, it may prematurely shut down the catcher-processor sector but it is less likely to have the same level of spill-over effect into other fishery sectors (if any) compared to a case where race for bycatch conditions exist between the three non-tribal whiting sectors.

Empirical evidence has shown that participants in the catcher-processor sector are able to achieve lower rates of bycatch than other fishery sectors and have less frequent "disaster tow" events than other sectors. This means that the probability of a large catch event occurring in the catcher-processor sector is less than in other sectors. This lower probability of an unexpectedly large catch event means that the risk associated with scenario 5 is less for the catcher-processor sector than the risk associated with scenario 4.

Effect of scenario 4 and 5 on safety

Scenarios 4 and 5 are not expected to have a noticeable effect, if any, on vessel safety. Because scenarios 4 and 5 are generally not expected to result in race for fish conditions, nor are they expected to decrease revenues compared to status quo, there do not appear to be mechanisms for adversely impacting safety conditions.

4.12.3.5 *Comparative Summary of the Effects of the Analytical Scenarios*

Scenario 1	• Continuation of existing cooperative and associated profitability • Risk of a "race for bycatch" developing among sectors, leading to decreased profitability
Scenario 2	• Similar profitability as with voluntary cooperative • Low risk of a "race for bycatch" but high risk on individual entities
Scenario 3a	• Same as scenario 2
Scenario 3b	• Same as scenario 2
Scenario 4	• Continuation of existing cooperative • Risk of a "race for bycatch" developing among sectors, leading to decreased profitability
Scenario 5	• Continuation of existing cooperative • Low risk of a "race for bycatch"

4.13 Processing and Other Labor

The proposed action is expected to indirectly affect labor through changes to the harvester and processor sectors. Effects attributable to the specific program features that differentiate the analytical alternatives cannot be discerned, except for general effects due to the allocation of quota shares or co-op processors ties. For this reason it is not possible to contrast the effects of each analytical scenario so this section only discusses the types of broad-scale effects described in the introductions to the sections covering other environmental components.

Processing requires skilled and semi-skilled labor in a variety of categories ranging from general labor involved in activities like unloading vessels to more skilled labor that processes the fish and operates and maintains the equipment in processing facilities. Those employed in managerial positions (as opposed to owner-managers) fall in the labor category. Processing labor also includes the people aboard catcher-processor and motherships that are exclusively involved in processing activities; others aboard these vessels fall in the category of captain and crew. Labor other than those actually working in fish processing facilities affected by the proposed action are employed by input suppliers. The effects on other labor are not specifically identified, although they can be inferred from the description of effects to processing labor and firms that act as input suppliers (Section 4.14). The characteristics of the labor force affected by the proposed action are presented in more detail in Section 3.X.

Table 4-31 is a schematic of the way in which effects to labor are evaluated here. Fundamentally, the effects on labor due to trawl rationalization will be changes in personal income and employment, but whether the result is an increase or decrease in either depends both on the characteristics of the firm employing the labor and how the rationalization program affects their decision making. Because of differences in the operational characteristics of processors of whiting versus non-whiting groundfish processors, labor in these two sectors in turn may be affected differently. No matter the type of processor, labor will be indirectly affected by whether or not quota shares are allocated to processors. If harvester cooperatives are implemented for the whiting sector, a requirement for vessels to be tied to a specific processor could have a similar effect. Allocating quota share to processors or requiring processor ties would give them more leverage in negotiations with harvesters, likely increasing profitability. This would affect business planning in ways that are likely to affect wages paid and the number of processing-related jobs. Although measurement criteria are listed, because the evaluation is qualitative there are no numeric predictions of changes in these metrics.

Table 4-31. Impacts, mechanisms and metrics for labor.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Increase/decrease in income and employment in processing and related occupations	Economic performance (e.g., productivity) of processing firms affecting labor productivity	• Change in the number and location of related jobs • Change in wages and salary in related occupational categories	• Qualitative assessment based on expert opinion • Projections of geographic shifts in delivery and fishing activity • Indirect effects from impacts on processors
	Changes in the operational characteristics of processing facilities		
	Change in number of processing facilities		
	Change in the location of processing facilities		

The principal difference among processing firms likely to affect labor is the size of their processing facilities and the degree to which they are able to switch production to different product forms. Shore-based whiting processors currently must handle large volumes of fish in a relatively short time period because the whiting fishery tends to function like a derby with harvesters competing to catch the available quota. During the part of the year when there is no whiting fishery processors have an incentive to diversify into processing other products in order to maximize returns to the larger plant capacity they have to invest in. By the same token, their labor demand will vary through the year, to the degree they are unable to keep their plant at operational capacity. For example, if the plant cannot be put to another use outside of the whiting season, such as processing non-whiting groundfish or Dungeness crab, most of the jobs in the facility will be seasonal. This is less of a problem in the at-sea sector because motherships and catcher-processors are mobile and can be deployed to the Alaskan pollock fishery. (Furthermore, the measures proposed for the catcher-processor fleet largely maintain the status quo so related processing labor would be unaffected.) Processors specializing in non-whiting groundfish deal with lower volumes and a steadier supply because of cumulative trip limits. They may also require somewhat different types of labor than whiting processors if their operation is less mechanized and they deal with a greater variety of species and product forms.

The decision to allocate quota shares to processors, and how much is allocated to them, affects their bargaining position vis-à-vis harvesters (see Section 4.5). The processor tie requirement in the mothership and shorebased cooperative alternatives may have a somewhat analogous effect. Any resulting increase bargaining power will tend to reduce ex-vessel prices and increase processor profit margins. Changes in processor profit margins are expected to have an indirect effect on processor labor. It is reasonable to expect that changes in profit margins for processors will have a corollary impact on wages paid to laborers, though perhaps not at a 1 to 1 ratio.

To the degree increased profitability stimulates new capital investment, to increase either the scale or scope of current operations, labor demand could be affected. Investment to scope could mean the development of new product forms and new markets, possibly accompanied by greater specialization in one product category and an adjustment in the skill required of processing laborers. Investments to increase the scale of operations (the ability to process larger volumes) could also create greater demand for skilled labor, if larger operations are more mechanized. A move to specialize, whether or not accompanied by the development of new product forms, could likewise create demand for skilled labor, perhaps of a different sort. For example, such operations might be less mechanized but require more skilled hand-processing of fish. In either case, the final effect on employment and income would be related to changes in productivity. This could reduce overall employment if fewer people are needed per unit of product processed. While an increase in demand for more skilled jobs would imply higher wages and an increase in personal income, the degree to which this occurs would depend on labor supply and the degree to which firms are willing to pass on productivity gains to workers in the form of increased wages. Increased labor supply would tend to decrease wages. The pool of available labor could increase for closely related reasons if processing firms lay off workers because of productivity increases. However, labor availability would probably be more affected by general trends in employment and the wages workers would be willing to accept. Changes in the meatpacking industry offers an example of how a variety factors, including industrial consolidation and greater availability of immigrant labor, has led to a decline in wages without substantial gains in productivity {Kutalik, 2008 1486 /id}.

One of the broad effects of rationalization is to even out the supply of fish over the year. As discussed above, this is more of a factor in the whiting fishery since it tends to operate as a derby fishery. If plants are able to operate for a larger part of the year with less variation in through-put this would make employment less seasonal. To the degree that needed plant capacity or the number of plants is reduced as a result (and the correlation between physical capacity and labor requirements) this could result in a fewer number of jobs but ones that are more stable. The net effect on personal income partly depends on whether seasonal workers are under-employed (because they cannot find comparable work in the off season). Steadier supply might contribute to the ability of processors to specialize or develop new product forms and markets. If this demands skilled labor, it could lead to wage increases.

A rationalized fishery may facilitate long-term planning leading to new investment, the development of new product forms and new markets. The phenomenon would be more likely if processors are allocated quota share because of the greater control it would give them over the timing and location of deliveries and the price paid. A desire to increase efficiency and profitability could lead to the consolidation of operations, meaning fewer, but perhaps larger, processing facilities. Another factor that could influence the location of facilities would be the potential change in trawl vessels' home ports because of fleet consolidation and the comparative advantages of some ports (see Section 4.15.5). Allocation of quota share to processors could temper this effect if they want to maintain facilities in less advantageous ports. Whatever the final outcome, these factors could change which communities the jobs are in and the overall number of jobs. If the consolidation of processing facilities results in greater mechanization this could change the types of jobs in demand and related jobs in the same way as discussed above.

If geographic shifts in delivery and processing activity occur as a result of rationalization, processing labor is likely to be affected on a regional scale. Based on the regional comparative advantage analysis, some processing centers in central and southern California may see some amount of groundfish processing decrease and as a result the demand for processing labor in these areas may decline. Inversely, other areas of the coast may see an increase in the amount of delivery and processing activity meaning the demand for processing labor may increase leading to more processing labor jobs and/or increases in the wages paid to processing laborers.

4.14 Input Suppliers

As with processing and other labor (Section 4.13), while there are likely to be substantial effects to input suppliers, it is not possible to discern effects among the analytical scenarios, because the differences in program features are not great enough to vary these indirect effects.

Businesses that supply inputs to groundfish trawl harvesters may be indirectly affected by a trawl rationalization if the program causes behavioral changes in trawl groundfish harvesting operations. At the level of the firm these effects depend on an input supplier's size and location. Although there are a variety of businesses that supply inputs to the trawl sector, for many the trawl sector accounts for a small proportion of sales, either because they sell to firms and individuals across the economy (e.g. grocery wholesalers/retailers) or they sell to harvesters in many other fisheries (e.g., marine electronics retailers). Smaller, specialized retailers located in ports where groundfish trawlers are an important component of the local fleet (in terms of purchases, not necessarily number of vessels) would be more affected by changes in demand for inputs. Those most affected depend on the trawl sector for a large proportion of their sales. The types of suppliers most affected by trawl rationalization would be:

- Small retailers of specialized equipment and materials (e.g., ship chandlers, hardware stores).
- Dockside fuel suppliers.
- Suppliers of specialized services (e.g., welders, riggers, equipment installers).
- Equipment manufacturers for whom groundfish trawl vessels account for a large proportion of sales (e.g., boat builders, net manufacturers). These manufactures fabricate specialized equipment and either sell directly or through local retailers.
- Firms that contract observers to the groundfish trawl sector.
- Brokerage firms that handle the sale/transfer of IFQs.

Although crew labor is generally considered a variable input, effects on crew are discussed in Section 4.xx.

Table 4-32 lays out how impacts to input suppliers are evaluated. The impact mechanisms are related to the type of input. Certain inputs can be related to variable costs and capital investment. Food, fuel, and other expendable supplies; services; as well as certain equipment that must be regularly replaced are variable costs related to operations. Capital investment represents large fixed costs such as the purchase of new vessels or processing facilities.

Contracting of fishery observers is also a variable cost related to fleet-wide days at sea. But the provision of fishery observers will be affected by other factors aside from vessel operations related to the implemented monitoring and reporting program, so it is considered separately.

Brokerage firms handle the transfer of IFQ or QP and their fee structure is related to sale/transfer activity. Although such transactions could be negotiated by the IFQ owner and potential purchasers, information constraints (knowing who wants to buy what and at what price) would likely make the use of a broker more cost effective in many cases. IFQ sales would be related to consolidation as some permit owners sell out and exit the fishery. Such sales could also occur if those operations that stay in business need to rebalance their IFQ portfolio, for example to match a particular fishing opportunity in which they want to specialize. IFQ leasing would essentially serve the same functions without permanent transfers and such arrangements could also be mediated by brokers. QP sales would most likely occur to cover unexpected overages.

Table 4-32. Overview of analytical approach used to compare baseline and future conditions of input suppliers under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes in the economic performance (e.g., profitability) of individual input suppliers	Consolidation of harvesting sector as well as spatial redistribution of fishery related activity	Fuel expenditures Food expenditures Expenditures on services (maintenance and repair) Expenditures on frequently replaced equipment and materials	• Qualitative assessment based on expert opinion • Projections of geographic shifts in delivery and fishing activity • Indirect effects from impacts on harvesters
	Changes in the economic performance (e.g., profitability) of harvesters and processors	Capital investments made by processors and harvesters	
	Reporting and monitoring requirements	Expenditures on observers	
	Transfers of QS and QP and cumulative trip limits	Ex-vessel value of transfers	

Consolidation means that fewer vessels would operate in the groundfish trawl fishery. This is expected to lead to an overall reduction in demand for inputs specifically related to the trawl fishery. However, if vessels leaving the groundfish trawl fishery continue to operate on the west coast in some fashion (in other fisheries, for example) the drop in demand could be modest, since many inputs are not so specialized as to be used exclusively when trawl fishing. By the same token, if the vessels leave the region or are scrapped this would contribute to a fall in demand for inputs. The relocation of vessels is related to consolidation and the comparative advantage of ports and would adversely affect retailers and service providers located in disadvantaged ports.

Fuel represents a major variable cost in fishing operations. Local fuel suppliers would be similarly affected by vessels relocating. Since fleet consolidation is intended to increase efficiency it is expected to reduce overall demand for fuel. For example, a fewer number of larger vessels would likely use less fuel overall. An ability to optimize fishing activities over the course of the year, which as discussed elsewhere would be a bigger factor in the whiting fishery, could also decrease fuel expenditures. This would tend to occur as vessels fish in a more "rational" pace and optimize their costs relative to revenues. This could mean that the overall amount of time spent at sea decreases as effort is spread across more months the year. Input suppliers that operate on a larger regional scale (such as net manufacturers that sell to vessels all along the west coast) would be largely unaffected by shifts in the location of vessels but could be adversely affected if fewer of these types of inputs are needed.

Trawl rationalization is expected to increase the profitability of harvesters, and processors depending on the allocation of IFQ. This could lead to greater capital investment, benefiting some input suppliers. Harvesters remaining in the fishery could invest in new vessels, or vessel configurations better matched to changes in operational characteristics resulting from rationalization (e.g., change in the pace of fishing, specialization). For the most part, processors have investments in plant and equipment that may be impracticable or not cost effective to move if they relocate operations or consolidate to certain locations. This could stimulate the purchase of land, buildings, and equipment.

Observer coverage will undoubtedly increase under a rationalization program. An increase in observer coverage levels could be counterbalanced somewhat over the long term if the fleet consolidates to a fewer number of vessels. Thus firms that contract fishery observers are likely to benefit from trawl rationalization.

Any trawl rationalization program that includes IFQs will benefit brokerage firms that handle IFQ transactions. The level of transfer activity, which dictates the fees they receive, depends on the level of consolidation and the need for operators to balance share portfolios to match the mix of species they plan to harvest or actually harvest (the latter might be covered by QP purchases instead, but such transfers could still involve brokerage firms). Portfolio rebalancing is likely to be an ongoing activity but over the long term would tend to involve transacting fewer shares as portfolios better match harvesters' operational characteristics. Consolidation will likely occur over the long term but involve a larger volume of shares overall.

4.15 Communities

In this section we describe the impacts of rationalization on communities. The MSA defines a fishing community as "a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (MSA §303(a)(9)). In interpreting this definition, the National Marine Fisheries Service has stated that "A fishing community is a social or economic group whose members reside in a specific location..." (63 FR 24211). As such, we interpret community to mean a geographic location, as opposed to an occupational community or a community of interest.

This section begins with a discussion of how trawl communities are identified, followed by a discussion of methods and metrics used to illustrate impacts. Next, we discuss the broad-level effects of rationalization on communities, including lessons learned from other rationalization programs. This section provides a big-picture look at issues, independent of the differences between the analytical scenarios. Community impacts depend in large part on impacts to harvesters and processors, so the reader is also directed to Sections 4.7 (limited entry trawl harvesters), 4.8 (captains and crew), 4.9 (non-trawl harvesters), 4.10 (shoreside processors), etc.

Following the description of broad-level effects, we assess the impacts of the analytical scenarios. This section begins with a discussion of the community implications of each scenario, followed by a discussion of each element (or row) in the scenarios. Following this section, we discuss impacts on specific communities, when possible.

At the end of this section we provide a summary of the effects of trawl rationalization on each trawl community identified. Finally, we assess cumulative effects. This section briefly summarizes past and present actions with ongoing effects on communities, and reasonably foreseeable future actions that are expected to have effects. The effects of these past, present, and reasonably foreseeable future actions are combined with the effects of the analytical scenarios to arrive at cumulative effects.

The trawl rationalization process could have a profound impact on many coastal communities that depend on trawling as a source of revenue. If the history of the implementation of other IFQ programs is a guide, rationalization will result in social impacts being felt in a range of communities, as fewer vessels participate in the fishery and fewer communities are the sites of processing effort. Trawl rationalization is expected to result in changes in the spatial distribution of effort and processing, along with consolidation of vessels and processors. These changes will have both positive and negative impacts on fishing communities.

The transition to a trawl IFQ program is intended to result in an overall gain in value of the fishery. As fishers find creative ways to avoid overfished stocks and access underutilized target species, overall harvest levels are expected to increase. At the same time, catch and efficiency will increase, along with participants' ability to pursue value-added opportunities. There will be fewer, yet more stable, jobs across a range of sectors, and a redistribution of income and revenue opportunities will occur. The elements of rationalization that relate to community impacts are outlined in more detail below.

4.15.1 Methods for Assessing Community Impacts

In this section we describe the methodology for assessing the impacts of rationalization on trawl communities. Section 4.15.1.1 explains how trawl communities were identified. Section 4.15.1.2 discusses impacts, mechanisms, and metrics.

4.15.1.1 *Identification of Trawl Communities*

Trawl communities were defined based on whether or not they were a "principal port" for active trawlers. A principal port is one where the majority of a trawl vessel's whiting and nonwhiting landings took place during the period from 2004-2007. Ports meeting this "principal port" criteria include Astoria, Bellingham Bay, Blaine, Brookings, Charleston/Coos Bay, Crescent City, Eureka, Fort Bragg, Ilwaco, Monterey, Morro Bay, Moss Landing, Neah Bay, Newport, Princeton/Half Moon Bay, San Francisco, and Westport.

Of these ports, Blaine and Monterey were removed from the list of current trawl ports. Blaine was removed because the last remaining processor of trawl-caught groundfish closed in late 2006, and trawlers that delivered to that processor have started delivering to Bellingham. It is possible that Blaine will once again be an active trawl port if a processor reopens there. Monterey was removed because trawlers have generally stopped delivering there. Other communities, such as Avila, were recently considered trawl ports, but over time, trawl activity has dissipated and now only marginal amounts of landings occur in these ports. No trawlers currently use these ports as their principal port, so these ports are not defined as trawl communities.

Morro Bay is a special case. Trawl activity was nearly eliminated in Morro Bay due to a Nature Conservancy buyout in 2006, in which seven trawl permits and four trawl vessels were purchased by the nonprofit (these permits are now held in San Francisco, where The Nature Conservancy is located). However, The Nature Conservancy has indicated that they plan to use those permits and associated IFQ on vessels fishing out of Morro Bay in the future. Therefore, this community is identified as a trawl community.

In addition to these ports, we consider impacts to Anacortes and Seattle. Anacortes is primarily a business center for the at-sea whiting fishery, while Seattle is both a business center and a home base for the at-sea fleet. The table below (in geographical order) summarizes the primary trawl activities of each community.

Port name	Whiting	Nonwhiting
Bellingham, Washington		X
Anacortes, Washington	X	
Neah Bay, Washington		X
Seattle, Washington	X	
Westport, Washington	X	X
Ilwaco, Washington	X	
Astoria, Oregon	X	X
Newport, Oregon	X	X
Charleston/Coos Bay, Oregon	X	X
Brookings, Oregon		X
Crescent City, California	X	X
Eureka, California	X	X
Fort Bragg, California		X
San Francisco, California		X
Moss Landing, California		X
Princeton/Half Moon Bay, California		X
Morro Bay, California		X

4.15.1.2 *Impacts, Mechanisms and Metrics*

Table 4-33, on the next page summarizes potential impacts, mechanisms for such impacts, and metrics and methods for assessing impacts. Impacts fall under six general topics: changes induced from changes to trawl harvesters, changes induced from changes in the processing sector, impacts to non-trawl communities and fisheries, cultural and social changes, changes in municipal revenues and community stability, and infrastructure impacts.

Table 4-33. Overview of impacts, mechanisms, and metrics used to assess community impacts.

Potential community impacts	Mechanisms for impacts	Metrics or indicators	Data, models, and methods for assessing impacts
Changes in amount of trawl vessel activity	Fleet consolidation Geographic shifts in delivery activity	Vessel and permit count, type, and location	Consolidation Model; Geographic shifts in fishery patterns; Initial allocation of IFQs;
Changes in crew wages and number of crew jobs	Fleet consolidation Changes in crew compensation structure	Estimated income in harvesting sector, fleet consolidation data; number and location of crew employed; hours of crew employment	Consolidation Model; Input from key informants
Changes in the relationships between crew and captains	Changes in compensation structure	Wages paid to crewmembers	Literature review of Ethnographic information; Qualitative assessment
Changes in the level of processing activity	Consolidation of processing sector; changes in bargaining power over exvessel prices, changes in the timing of deliveries	Number and type of active processors; municipal income data	Geographic shifts in fishery patterns; Consolidation model
Changes in the number of processing jobs and the seasonality of processing jobs	Changes in volume of landed catch; changes in the location of delivered catch; changes in the timing of harvest	Number and type of employment in processing sector; amount of seasonal/temporary employment vs. permanent employment	Geographic shifts in fishery patterns; Catch estimate model; qualitative assessment
Cultural and social changes	Families may experience increased stress due to economic and cultural change	Relationship between economic change and family stress	Qualitative assessment from relevant ethnographic studies
	Community identity may change if certain fishery sectors are lost	Relationship between potential loss of an industry and community identity	Qualitative assessment from relevant ethnographic studies
Changes in municipal revenues and community stability	Public revenues may be lost if trawl or processing sector shrinks	Estimated municipal revenues; raw and processed product cost/value	Income impacts derived from other EIS sections
	Depending on the importance of a “working port” to tourism to a community	Information on how important the local fishery is to the tourist industry	Qualitative discussion; community profiles; consolidation and geographic shift models.
Infrastructure impacts	Infrastructure may be lost if trawl or processing sector is reduced	Quality of infrastructure; vessel numbers, pounds of harvested species, change in landing patterns	Qualitative discussion; consolidation and geographic shift models.
Impacts to non-trawl communities and fisheries	Non-trawl communities may be affected by increased competition, impacts on infrastructure in trawl communities (resulting from gear switching and other fishery shifts)	Estimates of gear switching and shifts to other fisheries	NWFSC Consolidation Model; Geographic shifts in fishery patterns; Initial allocation of IFQs; NWFSC community profiles

The models used for this analysis are discussed in more detail in Section 4.2.1.3. Each potential impact is discussed in narrative form below.

4.15.2 Broad-Level Effects of Trawl Rationalization on Communities

This section elaborates on the broad-level impacts laid out in Table 4-33 above, based on lessons learned from rationalization programs described in the academic literature, impacts predicted by the models and theoretical tools described in Section 4.2 and Appendix C, and potential impacts identified through public scoping. Differences deriving from the analytical scenarios are described later, in Section 4.15.4.

As described in previous sections, a rationalized fishery is expected to change profit motivations and increase individual accountability, which in turn will change the way fisheries are pursued. These changes will contribute to secondary impacts on communities. The magnitude and location of fishing effort and processing, the volume and type of species harvested and processed, harvesting methods, and the number of vessels used to pursue fishing activity may all be affected. If rationalization is implemented, these changes will occur no matter which alternative (or scenario) is selected. However, options within the scenarios—such as accumulation limits, an adaptive management provision, and processor shares—will also influence communities.

There is a substantial body of research on ITQ programs (Adelaja et al., 1998;Baelde, 2001;Brandt, 2005;Copes, 1997;GAO, 2004;Knapp, 1999;Knapp and Hull, 1996;Lowe and Knapp, 2006;Macinko, 2008;McCay et al., 1995;McCay, 1995;NRC, 1999;Palsson and Helgason, 1995;Wilen and Casey, 1997). Several rationalization programs exist in the United States, including wreckfish in the South Atlantic region, surf clam and ocean quahog in the Mid-Atlantic, halibut and sablefish in Alaska, the Bering Sea crab fishery, the Alaska pollock fishery, and others that resemble a rationalized fishery or that are in the process of becoming rationalized. In addition, finfish IFQ programs exist in Canada, Iceland, New Zealand, Australia, Canada, the Netherlands, and elsewhere. Case studies of impacts from these programs are summarized in Section 4.4.2. However, not all are directly comparable to the program proposed for the West Coast groundfish fishery. In many cases, the focus of rationalization programs has been on ending the problems associated with Olympic, or derby-style, fisheries. Further below, some case studies of existing rationalized fisheries are presented, along with lessons learned.

In addition to a literature review, models were used to analyze the impact of the initial allocation of IFQ, the amount of fleet consolidation expected to occur, the potential for shifts in the location of fishing effort, the potential for changes in revenue and catch as a result of changes in bycatch rates, the comparative advantage of ports and regions in a rationalized fishery, and the regional economic impacts of trawl fishing activity. Theoretical tools were used to describe the outcomes of negotiation and power shifts between harvesters and processors. These models and tools are described in more detail in Appendix C, with some results described below.

In a nutshell, the main lesson learned from the literature on rationalization programs is that managers must balance the desire for increased efficiency in the fleet as a whole with the desire to protect communities through the use of limits on consolidation and transferability. A General Accounting Office study (2004:29) neatly summarizes both the lessons learned from other rationalization programs and the tradeoffs that must be considered:

> While an IFQ is a fishery management tool put in place to protect the resource, as well as reduce overcapacity, these laudable goals may have unintended consequences: the loss of communities historically engaged in or reliant on fishing and reduced participation opportunities for entry-level fishermen or fishermen who did not qualify for quota under the initial allocation. New IFQ programs or modifications to existing programs may be designed to address these problems by incorporating community protection and new entry goals. However, because the goals of community protection and new entry run

> counter to the economic efficiency goals, fishery councils face a delicate balancing act to achieve all goals. (29)

Similarly, a National Research Council (NRC) study notes that "achieving the goals of increased overall economic efficiency, more effective enforcement or administration, or more effective conservation through the use of IFQs may lead to reduced breadth of participation by fishermen, reduced total employment in the harvesting sector, and other shifts in the distribution of benefits from the fishery. The critical point is that these trade-offs be clearly identified, estimated prior to decision-making, and monitored subsequent to program implementation to provide information for adjusting the program over time and for designing subsequent programs" (1999:105).

In regard to both the New Zealand and British Columbia halibut programs, Dewees (1998:S137) notes:

> Probably the most important part of IFQ implementation involves the stakeholders deciding what they want the fishery to look like. Methods of initial quota allocation, aggregation limits, and transferability are the key issues that will affect outcomes. For example, if the goal is to sustain communities, some quota could be allocated to the community rather than to individuals…

Below, a more detailed description of observed and anticipated outcomes of rationalization is presented. Because of the cascading and interconnected nature of these impacts, we start with the major impacts of rationalization (consolidation and geographic shift) and move through impacts on harvesters and processors before discussing related impacts on communities, families, and non-trawl communities.

4.15.2.1 *Community Impacts from Fleet Consolidation*

Varying levels of consolidation have been documented in all existing ITQ programs, and models predict consolidation in the West Coast non-whiting groundfish trawl fleet on the order of 55-66 percent. The distribution of consolidation is of vital importance to communities. The literature suggests that consolidation tends to happen quickly after rationalization is implemented, even with limits in place.

Consolidation in the trawl sector (described in more detail in Section 4.7) is expected to increase revenue in the fishery, and to lead to a decline in the number of vessels. On a fleetwide scale, the reduction in the number of vessels engaged in the fishery is expected to reduce annual fixed costs. The *distribution* of this reduction, and limits on consolidation, are of particular importance to communities.

Consolidation limits are built into the trawl rationalization program considered in this EIS, but because of the nature of vessel efficiency in this fishery, the number of vessels is not expected to fall so far that the consolidation limits will be reached. The fleet consolidation and cost efficiency model (described in Section 4.2 and Appendix C) shows that in the West Coast groundfish trawl fishery, the most efficient vessels for harvesting non-whiting trawl groundfish are approximately 60 to 70 feet in length. The number of vessels may diminish by 50 to 66 percent, to a non-whiting fleet size that is somewhere on the order of 40 to 60 vessels. (The number would have to diminish to about 30 vessels in order to reach the proposed fleet consolidation limits). Vessels that are larger or smaller may find it more profitable to sell (or privately lease) quota shares and leave the fishery rather than remain. Some communities will experience the negative impacts of losing fishing activity, while others will benefit from the increased revenue of the successful fishing enterprises that remain.

Case studies of rationalization programs around the world have documented varying degrees of consolidation. McCay (1995:8) writes "…a review shows that the general pattern is one of consolidation and rationalization of harvesting capacity, though there are some exceptions… Rapid consolidation may occur even though the system is designed to limit transferability." Since each ITQ program reviewed takes place in a different fishery, with a different socioeconomic context and different program design, it is important to consider these differences before making generalizations. However, it is clear that constraints on consolidation can have an important impact on communities. For example, in the Icelandic cod fishery, massive consolidation led to a relatively small number of large companies owning the majority of the quota; in 1994, 70 percent of the smallest ITQ holders held just 10 percent of ITQs. This has led to public discontent, strikes by fishermen, the loss of fishing activity, and high rates of unemployment in small communities (Palsson and Helgason, 1995). In the Atlantic surf clam and ocean quahog fishery, McCay et al. (1995:99) found "a very rapid decline in the number of vessels actually involved in the fishery," declining from 135 vessels in 1990 to less than 50 in 1994. They note that by 1995, nine firms controlled 82 percent of the ITQ for surf clams, and 10 firms controlled about half the ITQ for ocean quahogs. Still, Adelaja et al. (1998) argues that monopolies did not develop in that fishery. Wilen and Casey (1997) found a small amount of consolidation in the British Columbia halibut fishery, where relatively strong anti-consolidation measures were included in the program design.

As predicted, economic efficiency of the fleet as a whole does seem to increase under rationalization. Several of the case studies described below document increased efficiency in the fishery. McCay et al. (1995) writes that in the surf clam and ocean quahog fishery, both fishing hours and productivity per vessel increased.

4.15.2.2 *Community Impacts from Geographic Shifts in Fishing Effort*

As a result of consolidation and increased efficiency, shifts in the geographic distribution of fishing and processing activity are expected to result from rationalization. In some areas, the presence of constraining overfished species will be an important factor. Vessels that traditionally operate in areas with relatively high bycatch rates (such as Neah Bay) will find themselves at a disadvantage. They are more likely to reach their quota of constraining stocks earlier, and be forced to stop fishing earlier than vessels in other areas. As a result, vessels will likely modify their behavior in order to decrease bycatch of overfished species. This could be achieved by switching to non-trawl gear, changing the location of fishing, moving to another port, or selling quota shares to another vessel and leaving the fishery. These actions could affect the trawlers' home and delivery ports, as well as other non-trawl ports that depend on the infrastructure present in nearby trawl ports.

Such geographic considerations are likely to be influenced by market conditions as well. If a vessel fishes in an area with a relatively high bycatch rate of overfished stocks, but is economically efficient and delivers to a port with good market conditions, then it may find ways to adapt in order to continue to fish in that area while avoiding bycatch.

Geographic shifts may also be affected by how quota is allocated. Depending on the allocation formula, some permit holders and catcher vessels may receive a greater or lesser amount of allowable catch than under status quo conditions. In addition, they may receive a difference in the mix of species allocated as quota compared to the mix of species currently harvested. In the long run, transfers of fishing privileges should occur in a way that is more optimal to individual harvesters, but that transfer will act as a cost to some individuals and as a benefit to others, with subsequent impacts on their ports and processors.

Consolidation is likely to have a geographic effect as well. Based on analysis of cost-earnings data, vessels of a particular size are more cost efficient than others. This relative degree of cost efficiency will mean that ports with a relatively large presence of efficient vessels may see less consolidation than those ports with less efficient vessels. If enough vessels are lost from a particular community, it may mean a decrease in the amount of fishing related activity occurring in that area.

4.15.2.3 *Community Impacts as a Result of Changes in Fishing Employment*

Studies of existing IFQ programs have documented impacts on fishing employment that include job loss, shifts in the compensation system from shares to wages, higher wages for remaining crew (despite lower crew shares), longer hours, changing skill requirements, changes in bargaining power between quota owners and crew, and quota owners charging crew for use of quota. These changes are discussed in more detail in Section 4.8. Researchers have also observed the development of new businesses based on leasing quota rather than harvesting.

The consolidation occurring in the trawl sector, and resulting impacts on fishing employment, will have varying effects by community. As some vessels become more efficient and others drop out of the fishery, there will likely be a loss of skipper and crew employment opportunities in some communities, and a gain in others. Unemployment caused by rationalization could lead to secondary impacts on community businesses if residents lose purchasing power; for example, during the implementation of rebuilding plans for overfished groundfish species, Goblirsch (2002) reported impacts on such businesses as car dealerships and restaurants. On the other hand, the crew members who remain in the fishery may earn more income and work more hours. Since crew are not individually licensed, trends in crew employment are difficult to track, but it seems reasonable to expect that the communities that are expected to benefit from rationalization will be those that see increased crew wages and crew hours; conversely, those that are expected to lose trawl activity will also lose crew employment opportunities.

Copes (1997:68) notes that a loss of fishing employment can have particularly negative impacts in isolated communities where there are few alternative employment opportunities. McCay et al. (1995) estimated a one-third decline in labor in the Atlantic surf clam and ocean quahog fishery between 1990 (when rationalization was implemented) and 1992. Surveys indicated that displaced workers tried to stay in the fishing industry but were unable to find work, in part because of downturns in other fisheries in the region. This is particularly relevant to the West Coast due to the recent closure of the salmon fishery.

4.15.2.4 *Other Impacts on Harvesters*

Other community-related impacts on harvesters include decreased flexibility for those not allocated quota, increased incentives to switch gear types in some communities, changing crew needs for those switching gear, impacts of gear switching on suppliers, changes in exvessel prices, and increased (or decreased) safety.

Under rationalization, harvesters who do not receive an initial allocation of quota will find it difficult to participate in the trawl fishery due to the cost of entering into the fishery. (However, even under status quo, would-be participants need to purchase a permit to participate, which is also a barrier to entry). McCay (1995:9) writes: “After the initial allocation, it is usually difficult for others to acquire shares because of the large value immediately created.” The GAO review of IFQ programs (2004:11) similarly notes,

> IFQ programs have also raised concerns about opportunities for new entry. As IFQ programs move toward achieving one of their primary goals of reducing overcapitalization, the number of participants decreases and consolidation occurs, generally reducing quota availability and increasing price. As a result, it is harder for new fishermen to enter the fishery, especially fishermen of limited means, such as owners of smaller boats or young fishermen who are just beginning their fishing careers.

For those with quota, regional differences in bycatch rates may encourage vessels to remain in the same port, but switch to other groundfish gear in order to reduce bycatch. For example, some vessels operating in high bycatch areas may choose to use pot gear instead of trawl gear. This could lead to new skill requirements for crew members and differences in the number of crew required on a vessel. Pot fishing could result in higher prices, since fish caught with pot gear tend to be of better quality, but will also likely result in a decrease in harvest volume since pot gear is less effective at catching many types of flatfish. Such a reduction in harvest volume may translate into fewer jobs on shore that would otherwise be needed to handle, process, and transport the harvest volumes associated with trawl gear. However, communities as a whole could be expected to benefit from gear switching options if the only alternative is a departure of fishing activity from that port because of bycatch issues.

The potential for gear switching is discussed in Section 4.7.2.1, which discusses reasons for potentially switching gears, such as market preferences, political pressure, proximity to high bycatch areas, and seasonality of market conditions.

Gear switching could have secondary impacts on suppliers. For example, price differences for different types of gear could reduce or improve supplier profits. In addition, suppliers may need to form new relationships with wholesalers and manufacturers of new gear types. If gear switching occurs suddenly, a supplier could be stuck with gear that cannot be sold.

Exvessel price is generally expected to increase relative to status quo if the entire allocation of IFQ is made to permit holders. Again, the distribution of these benefits to communities will depend on the distribution of consolidation and geographic shift. In addition, as processor initial allocation is increased, exvessel price is expected to decrease. In a cooperative program with linkages between harvesting and processing entities, it is unclear what will happen to exvessel prices.

Safety on board fishing vessels is generally expected to improve as a result of rationalization. Vessels do not fish in hazardous weather conditions to the same degree after the fishery is rationalized, and vessel owners are more able to maintain vessels and safety equipment. This maintenance is directly associated with the amount of net revenue generated by fishery participants, and therefore, a fishery that experiences an increase in net revenue will likely experience a decrease in safety-related incidents. In a survey of Alaska halibut fishermen under an ITQ program, Knapp (1999) found that more than 85 percent of halibut fishermen said IFQs had made fishing for halibut safer. Knapp noted that persons who liked or disliked IFQs for other reasons were more or less likely to state that IFQs made fishing safer. However, when asked about the most positive impacts of the IFQ program, safety was mentioned most frequently. On the other hand, McCay et al. (1995) found that crew felt that safety had declined in a rationalized Nova Scotia fishery, because crew worked longer hours and experienced more fatigue.

4.15.2.5 *Impacts on Fishery Processors, Infrastructure, and Suppliers*

In summary, a wide variety of potential impacts on processors has been predicted and documented in other rationalization programs. Like fishing businesses, processors are expected to consolidate and possibly move. This will have subsequent impacts on processor labor and municipal revenue. In addition, infrastructure could be positively or negatively impacted by geographic shift, having ripple effects on local non-trawl communities as well as the trawl sector. Businesses that support the trawl sector will also be impacted, depending on their location, specialization, and reliance on the trawl sector.

Impacts to processors are discussed in detail in Section 4.10-4.12, while impacts to processing labor and fishery support businesses are described in Section 4.13.

Processors

Other rationalization programs show mixed results related to seafood processors. Impacts will depend on the extent to which processing companies gain and control quota shares. In Alaska, sources suggest that halibut and sablefish processors were negatively impacted by an IFQ program because harvesters were able to leverage higher prices from processors (Matulich and Sever, 1999). In British Columbia, some processors benefited from trawl IFQs while others were negatively affected because of a change in the seasonality and distribution of landings.

Changes that have been projected include changes in bargaining power between processors and harvesters; regional shifts in landings due to market restructuring; regional impacts depending on how IQ is initially distributed; changes in quality, quantity, and mix of catch as operations become more flexible and market-driven; changes in harvest timing; potentially lower processor costs; and changing product output mix.

Many of these potential changes could have ripple effects on communities, particularly if processors relocate, consolidate, or change their hiring practices. If increased profitability stimulates development of new product forms and new markets, the ability to process larger volumes, increases in the scale of operations, and increased specialization, the demand for labor could be affected. For example, in some cases new skills may be required; in other cases, increased mechanization may mean a loss in jobs combined with a need for different skills. While an increase in demand for more skilled jobs would imply higher wages and an increase in personal income, the degree to which this occurs would depend on labor supply and the degree to which firms are willing to pass productivity gains on to workers in the form of increased wages. At the same time, the pool of available labor could increase if processing firms lay off workers because of productivity increases, and increased labor supply tends to decrease wages. However, labor availability would probably be more affected by general trends in employment and the wages workers would be willing to accept. Changes in the meatpacking industry offers an example of how a variety factors, including industrial consolidation and greater availability of immigrant labor, has led to a decline in wages without substantial gains in productivity (Kutalik, 2008).

In addition to changing labor demands, changes in the processing sector could affect municipal income to communities; for example, revenue from landings taxes may increase as the catch of nonwhiting increases in some ports.

Some specific effects on processors that may impact communities include the possibility of consolidation among whiting processors, and the possibility of increased processed volume among non-whiting processors. As discussed under the section on processors, it is likely that the rationalization of the whiting fishery will end the existing, condensed season because of an elimination of derby fishing activity. This extension in the season means that less processing capital will be necessary to handle the given volume, potentially leading to consolidation of processing activity. If consolidation means the closure of an existing plant (or plants), this could have adverse impacts on communities where those plants are located. However, plants that remain in the fishery could be more profitable because of a decrease in the cost associated with processing activity and this could potentially benefit those communities where remaining processors are located.

In the non-whiting processing industry, harvest volumes may be increased because of a decrease in constraining species bycatch and a subsequent increase in under-utilized catch of target species. This increase in target species catch may mean more utilization of processing capital and processing activity, meaning that the possibility of capital consolidation in the non-whiting sector is less than in the whiting sector. However, geographic shifts in fishing effort could lead to consolidation in processing activity at a localized or regional scale and an expansion in processing activity elsewhere.

Infrastructure

Infrastructure includes physical infrastructure such as docks and marinas; support services, such as gear stores, fuel stations, and ice suppliers; and fish buyers and processors. Due to consolidation and geographic shift, some communities could lose infrastructure or experience a decrease in the quality of infrastructure. In addition to affecting the communities where this takes place, this could affect local non-trawl communities that depend on infrastructure in trawling communities. For example, the loss of an ice plant in a community could affect all fisheries in that community as well as neighboring communities. On the other hand, communities that host the remaining trawl fleet could experience an improvement in their infrastructure as a result of increased profits and market stability.

Suppliers

Impacts on input suppliers are described in detail in Section 4.14. Clearly, fewer vessels operating in the trawl fishery will lead to an overall reduction in demand for support resources. The relocation of vessels is related to consolidation and the comparative advantage of ports, and would adversely affect retailers and service providers located in disadvantaged ports.

Businesses that support groundfish trawl harvesters may be indirectly affected by trawl rationalization if the program causes behavioral changes in trawl groundfish harvesting operations. These impacts will depend on an input supplier's size and location. Although a variety of businesses support the trawl sector, for many the trawl sector accounts for a small proportion of sales, either because they sell to firms and individuals across the economy (e.g. grocery wholesalers/retailers) or they sell to harvesters in many other fisheries (e.g., marine electronics retailers). Smaller, specialized retailers located in ports where groundfish trawlers are an important component of the local fleet (in terms of purchases, not necessarily number of vessels) would be more affected by changes in demand for inputs. Those most affected depend on the trawl sector for a large proportion of their sales. The types of suppliers most affected by trawl rationalization would be:

- Small retailers of specialized equipment and materials (e.g., ship chandlers, hardware stores)
- Dockside fuel suppliers
- Suppliers of specialized services (e.g., welders, riggers, equipment installers)
- Equipment manufacturers for whom groundfish trawl vessels account for a large proportion of sales (e.g., boat builders, net manufacturers). These manufactures fabricate specialized equipment and either sell directly or through local retailers
- Firms that contract observers to the groundfish trawl sector
- Brokerage firms that handle the sale/transfer of IFQs

If vessels leaving the trawl fishery continue to operate in some fashion (in other fisheries, for example), the drop in demand could be modest, since many support resources are not exclusive to trawl fishing. By the same token, if the vessels leave the region or are scrapped, demand for support would shrink.

Fuel represents a major variable cost in fishing operations. Consolidation is intended to increase efficiency, so it would be expected that overall demand for fuel would decline (for example, fewer large vessels would use less fuel overall). An ability to optimize fishing activities over the course of the year, which would affect the whiting fishery more than the nonwhiting fishery, could also decrease fuel expenditures. This would occur if the overall amount of time spent at sea decreased as it was spread across more of the year, because vessels could more effectively harvest fish as a result. Input suppliers that operate regionally (such as net manufacturers that sell to vessels all along the west coast) would be unaffected by shifts in the location of vessels but could be adversely affected if fewer of these types of inputs are needed.

Trawl rationalization is expected to increase the profitability of harvesters and processors, depending on the allocation of IFQ. This could lead to greater capital investment, benefiting some input suppliers. Harvesters remaining in the fishery could invest in new, larger vessels, or vessel configurations better matched to changes in operational characteristics resulting from rationalization. The movement or consolidation of processors could also stimulate the purchase of land, buildings, and equipment in the communities where consolidation takes place.

4.15.2.6 *Effects on Community Stability and Culture*

Community stability is often cited as a goal in natural resource management, particularly forestry (Robbins, 1987; Schallau, 1989a; Schallau, 1989b). A community stability program was initially included in the package of rationalization options, but was removed by the Council in March 2007 and replaced with an adaptive management proposal that could be used to serve a variety of purposes.

Rationalization could have both positive and negative impacts on community stability, depending on the distributional impacts of the program. In communities where fishing is culturally important, the loss of trawl activity could be a hardship. The literature suggests that equity issues may arise depending on how initial allocation is conducted. However, under the status quo, fishing community residents have reported a lack of community stability due to fluctuations in fishing activity and an inability to plan for the future (Goblirsch, 2002).

During the past decade, the groundfish fishery has experienced major declines in harvest levels, increasing regulation and area closures, and a 2006 buyout of trawl vessels. Many communities have already lost large portions of their trawl fishery, either through the trawl buyout or through dissipation of the fleet caused by declines in harvest limits. Thus, some have already begun to adapt (for better or worse) to the loss of the trawl sector. Any stability that remains in these communities is largely due to diversification, both within fisheries and outside the fishing industry. In some ways, rationalization is expected to improve stability in those communities that benefit from the program. By allowing for better business planning, higher wages for those remaining in the fishery, and better stewardship of the resource, rationalization should increase stability *in those communities that benefit from rationalization*.

However, it is clear that some communities will lose harvesting and processing activity. Whether these communities would continue to suffer under the status quo is arguable, but it is likely that current trends in increased regulation and decreased harvests would continue, at least until overfished species of groundfish are rebuilt.

Not surprisingly, impacts on communities from rationalization depend in large part on a community's dependence on the sector being rationalized. In Iceland, where (in 1996), about 73 percent of the value of goods exported consisted of fish and fish products and about 11 percent of the population was employed in fishing, rationalization had exceptionally negative impacts on small communities that depended on fishing (Palsson and Helgason 1995, NRC 1999). Since West Coast communities are not as dependent on fishing as Icelandic communities, such impacts are not likely here; however, particularly vulnerable communities could certainly experience declines if trawl activity is lost. In the United States, McCay et al. (1995:104) provides an example from the Atlantic surf clam and ocean quahog fishery where "the sell-out of the ITQ and harvesting and processing capital by a large multinational corporation resulted in the complete cessation of clamming and processing for one major coastal community of New Jersey for at least a year." Other potential problems noted by McCay (1995) include the loss of professional expertise, knowledge, and traditional culture in families and communities if ITQs lead to large-scale sell-outs. For this reason, many ITQ systems include special features to preserve community perceptions of equity, at least during the early period of the program. However, McCay notes that over time many of these equity preservation measures lose their effectiveness and may be abandoned as operators find innovative ways to get around them.

4.15.2.7 *Cultural Impacts*

Fishing, in all its diversity, is culturally important to the communities that will be affected by trawl rationalization. The cultural importance of fishing is reflected in community symbolism, such as statues or memorials to fishermen lost at sea (Seattle, Newport, San Francisco); municipal celebrations like the Blessing of the Fleet (Ilwaco, Westport, Newport, San Francisco); and other activities such as the Brookings 10K Salmon Run, Newport Seafood and Wine Festival, Charleston Seafood Festival, Coos Bay Salmon Derby, Seaman's Day (Warrenton), Astoria-Warrenton Crab and Seafood Festival, World's Largest Salmon Barbeque (Fort Bragg), and Morro Bay Harbor Festival.

However, in none of the trawl communities possibly affected by rationalization is trawling the sole fishing activity. The communities where the most trawl fishing activity takes place, such as Newport and Astoria, are also the communities where the most other fishing activity takes place. (It should be noted, however, that both Newport and Astoria are expected to benefit from rationalization). For diverse communities, a decline in trawl fishing activity might not change a community's symbolic identification with fishing, although it could have substantial impacts on the economic structure of all fisheries if it leads to a decline in infrastructure, and social impacts on those directly affected by rationalization.

Most trawl communities have a long history of involvement in other fisheries. Virtually all of the communities analyzed here had active Native American subsistence fisheries stretching back hundreds, if not thousands, of years. Commercial fishing on the West Coast largely began in the mid- to late-1800s, following a gold rush that directly or indirectly affected the entire West Coast. Salmon was the mainstay for most early fisheries from San Francisco north; further south, fisheries relied more on coastal pelagic species such as sardines, as well as abalone and other species.

Trawling came relatively late to the West Coast. The first sporadic trawl efforts began shortly after World War II, mostly in Oregon and Washington, and targeted pink shrimp. Foreign trawl effort in West Coast waters began in the mid 1960s, and the passage of the Magnuson-Stevens Act in 1976 began the process of domesticating the trawl fishery. Low interest loans and subsidies helped the trawl fishery and processing industry grow in the late 1970s. Meanwhile, a joint venture fishery allowed domestic catcher vessels to deliver product to foreign factory ships for processing. By the late 1980s, processing infrastructure had developed sufficiently to support the domestic trawl fleet, and foreign trawlers disappeared from the EEZ by 1991.

Based on the brief history of trawling relative to other fisheries, it seems likely that even communities that lose trawl activity would retain their identification as fishing communities. The number of trawlers remaining in most communities is relatively small, and other recreational and commercial fisheries would remain. However, as noted above, if infrastructure that depends on the trawl fishery is lost (for example, a processor or cold storage facility), other fisheries that depend on such infrastructure could also be affected, leading to further impacts on community identity.

Issues related to equity have also been observed in the literature. Differences between those initially receiving quota and those not receiving quota can lead to conflict and perceptions of unfairness. Creed (1994) conducted research in two fishing villages of southwestern Novia Scotia that suggested that the egalitarian ethos of those communities was severely constrained by the ability of a few processors and entrepreneurs to take advantage of the ITQ system, which exacerbated differences in wealth and status within the community. Similarly, Macinko (1997:169) notes that one impact of the way initial allocation was conducted in the Alaska halibut/sablefish ITQ program was to introduce "heightened social divisiveness within fishing communities and within the management process between haves and have-nots."

Even in communities where the loss or decline of the trawl fishery does not have a significant impact on community identity, families who are affected by the social change of leaving the trawl fishery could be affected. Such impacts are described below.

4.15.2.8 *Impacts on Families*

Families could be negatively affected by the loss of trawl and processing activity in communities that do not benefit from rationalization. In communities that do receive quota, the literature documents complications in family fishing businesses arising from the increasing value of fishing quota. Such complications relate to the "newly taxable dimensions of exit and the newly costly conditions of entry" (McCay 1995).

Since rationalization is expected to increase efficiency in the fleet as a whole, the mechanism for leaving the fishery will be to sell quota and associated vessels and equipment, so economic impacts of leaving the fishery will be *somewhat* mitigated. However, the non-economic impacts of leaving the fishing industry may be substantial. For example, a person leaving the harvesting sector and selling or leasing quota could experience a major change in personal identity and job satisfaction. In addition, the daily life of a fishing family, particularly a fishing family that has been involved in fishing for a substantial amount of time, could be expected to change dramatically if the family were to leave the fishing industry altogether. In some communities, loss of fishing jobs has been linked to increased marital stress and divorce (Goblirsch, 2002). Similarly, losses of businesses that depend on the trawl fishery can also cause social and economic upheaval. McCay (1995:7) writes, "Among the social implications of ITQs in fisheries are job losses, changing social relationships of production, changing social structures within communities, and increased concentration of rights, power and wealth within an industry." McCay writes (1995:9):

> ITQs have potentially profound consequences for fishery-dependent families and communities, consequences which are likely to vary according to the design of the ITQ regime, the prevailing kinship, inheritance and taxation systems, and other factors… Generally, with the rising value of ITQs, retirement and succession within family businesses have become problematic, and the solution of incorporation has its own costs that make it unacceptable to some, including, Hoefnagel writes (1994:70), 'the implied socio-cultural shifts and the potential loss of fishing rights for those members of the household—wives and daughters—not normally engaged in fishing.' Death and divorce can also force the exit of otherwise healthy firms from the fishery, as people find themselves forced to sell fishing rights to meet inheritance taxes or divorce settlements. Thus, a family-based fishery business may be particularly vulnerable to the newly taxable dimensions of exit and newly costly conditions of entry.

4.15.2.9 *Impacts on Tourism*

Tourism is also increasingly important to many West Coast communities. Tourism magnifies and exaggerates community symbolism; for example, tourist operations often focus on whatever is symbolic to a community, whether it be fishing vessels, loggers, or the Golden Gate Bridge. In fishing communities, tourism businesses are usually centered on a wharf or port area. Bellingham, Seattle, Newport, Morro Bay, and San Francisco are examples of communities where port areas are centers of both fishing activity and tourism. Such tourism may include fishing-related activities, whale watching, viewing commercial fishing vessels at work, dining, or shopping for fishing-related curios.

In some communities, such as Newport and Morro Bay, fishery-related tourism, including the draw of a “working waterfront,” is an important factor in the local economy. Langdon-Pollock (2006:26) writes, “The working waterfront also attracts the tourism industry to [Newport]. Tourists visit Newport to observe harvesters and processors on the bay front, participate in charter fishing activities, and purchase fresh fish directly from fishermen on the fishing vessels or from seafood markets. While the tourism industry does not provide many ‘living wage jobs’ to local residents, it does produce a lot of revenue for the overall community.” If a large sector of the fishing industry were to disappear, tourism revenues could be lost.

4.15.2.10 *Impacts to Non-trawl Communities*

Impacts on non-trawl commercial harvesters are discussed in detail in Section 4.9. The discussion is based on the NWFSC Consolidation Model, models looking at geographic shifts in fishery patterns, initial allocation of IFQs, regional impacts from rationalization, and potential gear, area, and species conflicts that arise through the gear switching provisions of the rationalization alternatives.

Non-trawl communities could be affected by rationalization in several ways:

- **Increased competition**. If the intersector allocation process allocates species (such as nearshore rockfish) to the trawl sector that they currently cannot target, they may be able to switch gears through the rationalization process and target these species, thereby competing with existing nontrawl fisheries.
- **Gear conflicts**. The gear switching provisions in the trawl rationalization program may induce more fixed gear effort than under status quo, potentially leading to on-the-water conflicts over available space for these gear types.
- **Impacts on the support sector**. The support sector (gear stores, repair shops, etc.) could be impacted by gear switching and by geographic shifts in fishery patterns.
- **Infrastructure impacts**. Non-trawl communities that depend on nearby trawl communities for processing or other support services could be affected by changes in those trawl communities. For example, trawl processors may also purchase fish from non-trawl communities. If these processors are adversely impacted, this could, in turn impact the non-trawl communities that depend on those processors.
- **Marketplace impacts**. Non-trawl commercial harvesters’ profits may be affected if trawl vessels change production in such a way that trawl vessel catch competes with non-trawl catch in the marketplace.

These impacts could have the subsequent effects on communities and families that are described above.

4.15.3 Decision Points Affecting Communities

Communities will be affected by four major decisions made by the Council during the trawl rationalization planning process. These are:

- Initial allocation
- Accumulation limits/grandfather clause
- Area management

- Adaptive management

These decision points will be described in more detail in the section below that discusses analytical scenarios. In addition, a 2004 GAO study reviewed an array of community protection measures used in domestic and international quota programs. Some of these measures are being considered by the Council; some were considered and rejected during the scoping process, and still others could potentially be implemented at a later date. The study listed several methods for protecting communities and facilitating new entry into IFQ fisheries. The "easiest and most direct way to help protect communities," the study noted (2004:3), was to allow communities themselves to hold quota, and to decide how to use it to protect local fishermen (for example, by keeping quota in the community or leasing it to local fishermen). This action could also be taken after implementation of an IFQ program.

Other methods have been used elsewhere, including rules to protect certain groups of fishery participants (such as small boat fishermen); rules governing who is eligible to hold and trade quota; temporarily prohibitions on quota sales for a given time after implementation; geographic restrictions on quota transfers; limitations on quota leasing; separate quotas for different sectors of the fishery; owner-on-board requirements; and restricting landings to certain ports. Although these actions protect communities to a certain extent, many also decrease efficiency or are difficult to implement (such as the owner-on-board provision).

4.15.4 Effects of the Alternatives Revealed by Analytical Scenario

In addition to the general effects described above, each of the analytical scenarios is expected to impact communities in different ways. The analytical scenarios result in different impacts because of variations in the elements of those scenarios. This section analyzes the direct and indirect impacts of the analytical scenarios on communities.

In this section, we begin by describing the manner in which each of the elements of the analytical scenarios is expected to impact communities. This description of expected effects serves as an overview and introduction to the way in which the elements of the alternatives will impact this particular environmental component. Immediately following the overview of how the elements of the analytical scenarios impact communities is a description of the impacts of each analytical scenario. Where appropriate, these impacts are compared to status quo conditions and to the other analytical scenarios. Following the description of impacts of each analytical scenario is a comparative summary of the effects of each of the scenarios.

How do IFQs and co-ops affect communities (relative to status quo)?

Changing the catch control tool in the fishery to IFQs and/or harvest co-ops is expected to impact communities in a variety of ways described throughout this section. Apart from this primary question, the main difference among the scenarios here is whether to have co-ops or IFQs for the whiting sector, and, if so, whether these co-ops should be for the at-sea whiting sector (Scenario 5) or the entire whiting sector (Scenario 4). In general, individual whiting harvesters may face more risks under IFQs than under co-ops, and if the risk is too high, they may forego catch of some species or switch to other gears. Such differences could subsequently affect communities, though the difference between the two choices is fairly minimal in regard to community impacts.

How does initial allocation affect communities?

Initial allocation and qualification could have significant impacts on communities by benefiting some vessels (and their communities) and putting other vessels and communities at a disadvantage. Astoria, Bellingham, Brookings, Coos Bay, Eureka, Fort Bragg, Newport, San Francisco, and Moss Landing are expected to benefit from initial allocation, regardless of how buyback history is allocated. Princeton/Half Moon Bay may benefit, depending on the allocation rule. Neah Bay, Westport, Ilwaco, Crescent City, and Morro Bay are expected to receive less than the average amount of quota allocated to all communities.

Under Scenarios 2, 3a, and 3b, initial allocation is based purely on catch history. Buyback IQ would also be allocated based on catch history. Distribution would be less equal, although individual fishermen might see it as more representative based on their past performance. Under Scenarios 4 and 5, the buyback history would be divided and shared equally in the nonwhiting fishery (Scenario 4) and in the shoreside fishery (Scenario 5). Some communities could benefit from this more equitable distribution. For communities, the differences between Scenarios 4 and 5 are minimal.

One factor that might influence communities is the ability of harvesters to form voluntary associations to manage risk. The term "risk pools" has been used to describe these arrangements. Such risk pools could contribute to stability in the communities that host them. If the initial allocation of groundfish—particularly constraining stocks—allows a relatively small number of entities to receive a large amount of constraining species quota, harvesters could have difficulty forming and maintaining voluntary risk pools.

If quota is allocated to processors, it is likely that processors will adjust operations so that ports where processing plants already exist will have more landings. Therefore, ports without processors (such as Neah Bay, Brookings, Crescent City, and Morro Bay) may see a reduction in landings if processors are allocated quota shares.

How will accumulation limits affect communities?

As discussed above, accumulation limits could also have an important impact on communities. The presence of a vessel accumulation limit would tend to increase the number of vessels in the fishery and spread the amount of fishing activity across a wider number of entities. With higher vessel accumulation limits, consolidation would tend to restructure the fleet toward the most economically efficient vessels, increasing fleet-wide economic efficiency and decreasing the number of vessels. Although vessel accumulation limits tend to lower economic efficiency and restrict profitability for the average vessel, they could help retain vessels in communities because more vessels would remain. An additional accumulation limit being considered is that of control limits, or a limit on the amount of quota an individual entity could hold. These are different from vessel limits. Theoretically, if there were no control limits (which is not an option included in this EIS), one community or company could buy up all IQ, to the detriment of all other communities and businesses. Therefore, control limits may indirectly protect some communities while preventing others from having a large influence over the harvest. Scenarios 2, 3a, and 3b allow the most accumulation of IQ; Scenario 4 the least. Scenario 5 lies between the two. Compared to Scenario 4, Scenario 5 has slightly lower limits for shoreside whiting, and higher limits for shoreside groundfish, motherships, and catcher vessels.

As noted above, because of the nature of vessel efficiency in this fishery, the number of vessels is not expected to fall so far that the consolidation limits will be reached. The number of vessels is expected to diminish by 50 to 66 percent, to a non-whiting fleet size of 40 to 60 vessels. (The number would have to diminish to about 30 vessels in order to reach the proposed fleet consolidation limits). Vessels that are larger or smaller may find it more profitable to sell (or privately lease) quota shares and leave the fishery rather than remain. In the whiting fishery, fleet size may shrink from 37 vessels to 23 in the shoreside fishery, and from 20 vessels to 14 in the mothership fishery. Some communities will experience the negative impacts of losing fishing activity, while others will benefit from the increased revenue of the successful fishing enterprises that remain.

How will a grandfather clause affect communities?

The effect of initial allocation of quota and accumulation limits can be modified by the existence or absence of a grandfather clause. The existence of this clause would allow some vessels and processors to have quota in excess of accumulation limits, based on their history.

A grandfather clause would make it more likely that highly productive vessels and processors would be able to maintain that relatively large degree of production, thereby protecting the status quo. Having no grandfather clause (as in Scenario 4) could make it more difficult for them to maintain historic levels of production. No grandfather clause could also limit the amount of quota in a community; for example a community with several large producers would receive fewer benefits than if there were a grandfather clause. Instead, excess quota would be distributed among IQ holders. In general, a grandfather clause might distribute quota less equally among communities, but perhaps more representatively, based on past performance. A grandfather clause could also benefit vulnerable communities with a few large producers that might suffer if there were no grandfather clause and excess quota were distributed to less vulnerable communities.

A grandfather clause could also influence the negotiations that occur between harvesters and processors over exvessel prices. If a grandfather clause exists, large producers could be in a strong position during such negotiations. Community impacts of such negotiations would depend on the locations of the processors and harvesters involved.

A grandfather clause is related to the concept of “risk pools” described above. A grandfather clause may increase the negotiation power of individuals, potentially disrupting the ability of harvesters to form risk pools for dealing with low OY species. Communities that stand to benefit from the presence of these risk pools may be better off without a grandfather clause – particularly for constraining species.

How do processor allocations/ties affect communities?

An initial allocation of IFQ to processors and/or processor linkages in a co-op program would allocate quota to processors and create affiliations between harvesters and processors under some scenarios, influencing negotiations over exvessel prices. With no processor ties or quotas (as under Scenarios 2 and 3a), harvesters would have more bargaining power. They could deliver anywhere and might be able to leverage higher prices from processors. If there are processor ties and/or processors own IFQ (under Scenarios 3b, 4 and 5), processors may be better able to influence where deliveries are made. The more IQ processors have, the more bargaining power they have. Such leverage could serve to help make their operations more efficient, possibly leading to consolidation or movement. (It is worth noting that many processors have corporate owners and may not necessarily be tied to an individual community. Therefore an allocation of quota to processors does not necessarily lead to quota remaining in a particular community).

With whiting co-ops and processor linkages (Scenarios 4 and 5), harvesters may find it more difficult to change processors, which could effect communities positively (if such linkages discourage harvesters or processors from leaving a community) or negatively (if local harvesters are forced to sell product for less than another processor might offer). A whiting processor could move, but a move outside of the current geographic distribution (southern Washington to northern Oregon) is unlikely due to geographic constraints and availability of infrastructure to support a large whiting processor.

How will the species covered through the program affect communities?

The species covered by the program could have an impact on communities, particularly in regard to potential races for fish. The number of species managed in the non-whiting fishery is the same across all scenarios. In Scenario 4, bycatch is pooled across the three whiting sectors, possibly leading to a race for fish (because of a race for bycatch). The entire whiting sector could close early once the bycatch cap is reached, impacting shorebased whiting communities such as Ilwaco, Astoria, Westport, Newport, Coos Bay, and to a lesser extent Eureka, Crescent City, and Fort Bragg, which has engaged in some whiting processing. (California whiting fisheries are early and small, and therefore the California fishery and associated communities might not be affected by a fishery-wide bycatch cap.) Under Scenarios 2 and 3, bycatch is managed at an individual vessel level, which does not create a race for fish. With all scenarios, geographic shifts would occur as fishing effort shifts to avoid bycatch, and because of regional differences in consolidation and economic activity.

In addition, non-trawl communities are concerned that if trawlers have an incentive to fish for nearshore species, competition with nontrawl fisheries (like Port Orford's) could occur. Trawlers would probably need to switch gear types in order to target such species because of their association with habitat not easily trawled. Targeting opportunities on these nearshore species would only occur if allocations that are larger than current catch levels are made to the trawl sector. Whether such allocations occur will be decided separately from the rationalization process, as part of routine biennial management of groundfish.

In general, the more species covered, the more constraints there would be on individual vessels' harvesting opportunities. The fewer species covered, the more flexibility vessels would have, though at the extreme, a lack of species covered with IFQ could lead to a race for fish. In dealing with species with small allocations, quota may become costly, and markets may become unstable and less efficient. Quota to cover catch deficits may also become unavailable. Communities might benefit from the increase in flexibility from having fewer species covered, but limiting the number of species increases the chances that the trawl sector will impact other sectors through competition over fish resources.

For some species, the possibility of a "disaster tow" exists. If it is difficult to purchase "protective" quota and if the risk of a disaster tow exists, harvest activity may creep earlier in the year and take on the characteristics of a derby fishery, because a disaster tow would mean that harvesters risked being preempted by other harvesters. It is difficult to judge the potential impacts of this possibility on communities, but if a disaster tow causes the fishery to close prematurely, communities would certainly be impacted.

How do the number of trawl sectors influence communities?

This section addresses the difference between having three or four trawl sectors. The main issue here is how much flexibility to allow. All the scenarios except Scenario 4 combine shoreside whiting and non-whiting into one sector. Under Scenario 4, these are divided into two sectors. In general, combining these into one sector allows for more flexibility because of fewer separations between sectors and, therefore, fishing opportunities.

If shoreside whiting and nonwhiting are separated, as in Scenario 4, new and existing harvesters who wanted to target both types of fish would need to buy quota in both sectors. For example, in some years, the bycatch of sablefish in the whiting fishery has been relatively large. Under a three-sector scenario, shoreside whiting harvesters could purchase enough sablefish quota to cover their bycatch and resume targeting Pacific whiting. If there are four trawl sectors, then the shoreside whiting sector could have trouble fishing if sablefish bycatch is higher than expected. Furthermore, the inability to transfer shoreside whiting sablefish quota to the non-whiting sector when it is not needed could result in a lost economic opportunity, with subsequent impacts on communities. On the other hand, with three trawl sectors it would be easier for wealthier owners to purchase and consolidate bycatch quota, which could affect communities since the catch of overfished species constrains the catch of all species.

One purpose for having four sectors would be to restrict the ability of one sector to acquire large amounts of quota and therefore limit the access of the other sector to quota or to fishing opportunity. This benefit could have both positive and negative impacts on communities, depending on which communities host the sector that benefits the most. In addition, having four sectors would maintain the sense of identity and separation between shoreside whiting harvesters and shoreside non-whiting harvesters.

How will an adaptive management provision affect communities?

Adaptive management allows a certain amount of quota to be used to a) help adversely affected communities; b) provide incentives to use habitat- and bycatch-friendly gear; and/or c) mitigate adverse impacts on processors (only under Scenario 3a). No further details on this option have yet been specified. If adaptive management were targeted toward gear incentives, community impacts would be hard to judge, other than noting that communities with creative and proactive vessel owners might benefit. If adaptive management is used to mitigate adverse impacts on processors, a very small number of processors would benefit, but communities could benefit if those processors are more likely to stay put. For communities, there is no difference between Scenarios 4 and 5. The benefits of the adaptive management provision (Scenarios 3a, 4 and 5) are entirely distributional: some communities would benefit and others would have their quota reduced in order to “pay” for the adaptive management provision.

How will area management affect communities?

Area management refers to the splitting of quota shares between the north and south, as in Scenarios 4 and 5. For the last few years, there has been less and less trawl activity off central and southern California, and more in northern California and Oregon. This option would essentially freeze this ongoing south-to-north shift. This could benefit southern California communities by lessening the ability of northerners to accumulate southern quota shares.

How will a carry-over affect communities?

Carry-over increases flexibility for individual harvesters, as quota shares would be carried over from one year to the next (but for one year only). A carry-over allowance allows harvesters to avoid penalties associated with a deficit condition. In general, flexibility creates options that typically lead to better economic conditions. Communities would benefit from carryover.

How will tracking and monitoring affect communities?

Tracking and monitoring will reduce the short-term profitability of harvesters because they will need to pay for part of the tracking and monitoring effort. In the long term, however, at-sea monitoring will help ensure the continued viability of stocks. Better catch accounting improves stock assessments, even if the primary objective for such accounting is not biological but administrative. This option will not affect communities differentially, and cannot be further analyzed until it is considered separately in June 2008.

4.15.4.1 *Scenario 1*

Many fishing communities are faltering under the status quo. The need to protect overfished species has led to increasingly strict regulations, including lower harvest limits, gear restrictions, and no-trawl zones. The lack of long-term planning ability has made it difficult for both fishing and support businesses to remain viable, and the number of trawl vessels has been shrinking (in part due to the 2003 buyout). Public testimony under groundfish management agenda items has repeatedly emphasized the difficulties communities and businesses experience in the face of increasing regulation. A summary of major themes presented in public testimony during the 2007-2008 groundfish specification process (PFMC 2006) includes comments on

- the negative cumulative effects of both Federal regulations (such as closed areas, fathom restrictions, season restrictions, and VMS) and non-Federal actions (cable crossings, proposed state restrictions) on fisheries, businesses and communities;
- crumbling infrastructure (processors, buyers, ice plants, and businesses that support processors closing or consolidating; docks and harbors not being maintained; market infrastructure collapsing);
- recreational and commercial fishing vessels going out of business or being forced to diversify;
- vessels being under-maintained, under-insured, and neglected;
- fishing-related businesses, such as gear stores, boat repair shops, tackle shops, and fishing equipment manufacturers, and non-fishing related businesses, such as hotels, restaurants, and car dealerships, feeling the impacts of reduced fishing income, including laying off employees or closing;
- decreasing tax bases due to business closures;
- increasing social tensions in communities, such as psychological impacts, marital tension, divorce and suicide;
- difficulty in making business decisions and planning for the future;
- and further dependence on groundfish due to salmon cutbacks.

Although these comments relate to all groundfish fisheries (not just the commercial trawl fishery), they give an indication of the state of the status quo in West Coast fishing communities.

4.15.4.2 *Scenario 2*

Scenario 2 is market-centric, with a high level of individuality and individual accountability. This scenario was created to demonstrate the effects of a market-driven system. Along with Scenarios 3a and 3b, this contains the fewest constraints on fishing activity under a rationalized program.

Under this scenario, which is the most “laissez faire” of the scenarios, the differential distribution of community impacts would be most pronounced. The provisions contained in this scenario, such as higher accumulation limits, a grandfather clause, and carryover, would allow more consolidation in the fishery than other options. As a result, some communities (such as Astoria and Newport) would benefit from the consolidation of fishing activity, while others with less trawl activity and less efficient fleets could lose their trawl fishery altogether. Available information suggests a general regional shift in trawl fishing activity toward ports found in Oregon and northern California. That activity may be drawn from ports in central California. The lack of area management and the lack of an adaptive management provision provides little recourse for readjusting the location of trawl fishing activity should communities in one region be adversely impacted.

Under this scenario, all groundfish species and Pacific halibut are covered by IQs, increasing constraints on harvesting, but lessening the likelihood of a race for fish that could occur if fishery-wide bycatch limits were in place. This scenario establishes three trawl sectors (versus four) by allowing both shoreside sectors to trade quota among one another. This gives shoreside whiting and non-whiting harvesters more flexibility to trade quota in order to cover unexpected catch events, leading to greater certainty that harvest activity will be realized. There are no co-ops; this scenario holds individual entities accountable for their own catch. Although permits receive the entire initial allocation, this scenario would not preclude an allocation to processors if those processors hold limited entry trawl permits. Making an allocation of quota share to processors would likely lead to a different geographic effect than not making an initial allocation to processors simply because processors are located in distinct areas.

4.15.4.3 *Scenario 3*

Scenarios 3a and 3b address the Council's request to contrast two methods for responding to processor concerns. The only differences between these scenarios and Scenario 2 are that Scenario 3a includes an adaptive management provision (targeted at processors that are adversely impacted by a rationalization program), and Scenario 3b provides an allocation to processors (but no adaptive management provision). The two methods have substantially different philosophies, and presumably impacts. The initial allocation of IFQ to processors would tend to leave many aspects of the outcome up to private industry and the market, whereas an adaptive management program would allow the Council more direct influence over impacts of the program on processors, leading to indirect effects on communities.

While scenarios 3a and 3b are likely to have different effects on communities, it is not immediately clear what those effects will be. Some effects are likely to be distributional with fishing activity concentration being different in 3a compared to 3b. For example, 3a might have a distributional effect that is similar to scenario 2 in an aggregate sense since most of the quota will be in the hands of harvesters, but with a small subset of quota being directed to a small set of processors through the adaptive management provision, indirectly affecting a small set of communities. Scenario 3a might look different from this as processors hold a relatively greater proportion of quota share and use it in a way that benefits them, resulting in a geographic outcome different than scenario 2 and 3a.

4.15.4.4 *Scenario 4*

Scenario 4 has the most constraints of all the scenarios and would distribute IQ more equitably among communities. This scenario uses market-mitigating factors and harvest co-operatives (instead of IFQ) for the whiting fishery. Harvest co-operatives are like a community where members collectively decide the prosecution of fishing opportunities. Under an IFQ system, in contrast, harvesters would be expected to act more independently. This scenario places constraints and controls on market outcomes through sector divisions, no grandfather clause, an adaptive management mechanism, relatively small accumulation limits, and area management. This scenario gives more influence to processors by giving them relatively large IFQ allocations and requiring that co-ops be linked to shorebased processors and motherships. Also in this scenario, the species covered in the whiting fishery are limited to whiting and bycatch species. Overfished stocks are allocated based on either the bycatch rate allocation approach, or based on a pro-rata to the whiting allocation. The approach depends on the sector, but the intention is to establish a more "equitable" initial allocation than using catch history.

The outcome of scenario 4 is likely to result in a wider distribution of fishing activity because of a lack of grandfather clause and relatively small control and accumulation limits. This would tend to distribute quota among a greater number of entities, and to the extent that a greater number of entities means a wider geographic distribution, a relatively wider set of communities may be the site of fishing activity. However, the fact that four trawl sectors are established and no carry-over exists inserts a factor of risk on trawl vessels – in particular, non-whiting trawl harvesters. This factor was discussed in more detail under the section describing impacts to trawl harvesters. If this risk results in adverse impacts to trawl harvesters that are realized (such as premature closure of the fishery), communities may be affected indirectly.

The adaptive management provision present under this scenario may be used to mitigate against adverse impacts to communities, but may be used for other purposes. The presence of this provision can prove useful to those communities that may be adversely impacted, but may mean a reduction in some activity from those communities better positioned to take advantage of a rationalization program.

4.15.4.5 *Scenario 5*

Scenario 5 falls between Scenarios 2 and 4 by allowing for more market-driven outcomes than Scenario 4. This scenario imposes harvest co-ops for the at-sea portion of the trawl fishery instead of all whiting sectors. Shoreside whiting and non-whiting activity is covered through IFQ on all species. A more moderate degree of market influence is achieved by allowing carry-over provisions, allowing for three trawl sectors, establishing accumulation limits that are between Scenario 2 and 4, and requiring that 50 percent of the a vessel’s catch history in a co-op program be linked to a mothership (instead of 100 percent of catch history).

While the adaptive management provision is only applied to the shoreside sectors, the same level of community impact is expected to occur as with an adaptive management provision that applies to all trawl sectors. This is because the at sea fisheries are heavily associated with the Puget Sound region and any application of adaptive management to those sectors is not likely to change that association.

The presence of a grandfather clause in this scenario allows historically large producers to remain in particular communities meaning that communities with a relatively heavy involvement in trawling may be more likely to continue that role than if a grandfather provision is not made available.

4.15.5 Impacts on Specific Communities

Next, we review each trawl community, reviewing its levels of dependence and vulnerability, along with expected effects of trawl rationalization as revealed by analytical scenario. Much of the information on the current status of these communities comes from the short form community profiles prepared by NWFSC. Additional details about the current status of these communities are included in Section 3.15 (affected environment), and in Appendix C.

The Comparative Advantage model (described in Appendix C) uses four variables to assess the relative advantage or disadvantage of each port. The four variables are: 1) bycatch rates of constraining stocks that are in preferred fishing grounds of various ports, 2) relative economic efficiency of vessels in that port, 3) the relative amount of fishing business and infrastructure that exists in that port, and 4) the initial distribution of quota shares to those ports relative to status quo, and relative to the distribution made to other ports. Appendix C details how these variables were measured.

The model shows that Bellingham, Neah Bay, Newport, and Princeton/Half Moon Bay have greater than 50 percent of their non-whiting trawl catch occurring in areas identified as a moderately high or high bycatch area. This gives them a disadvantage compared to other communities. (The high bycatch area where the Newport fleet fishes is a “moderately” high bycatch area because it is made up of species

(POP and darkblotched) that are less constraining to harvest activity than other species.) These figures are shown in Table 1, Appendix C.

Although these ports are engaged in relatively high constraining bycatch areas, other factors influence the comparative advantage that vessels have in a rationalized fishery. These include:

4.15.5.1 *Efficiency*

The efficiency of the local fleet will affect how a port fares as a result of rationalization and consolidation. Using information from the cost efficiency and fleet consolidation model (described in Appendix C), the relative efficiency of vessels delivering to various ports can be assessed. The efficiency score is best measured as a state variable (versus a relative variable). Those ports with the largest number of efficient vessels score high, while those ports with the smallest number of efficient vessels score low. Using this method, the ports of Astoria and Coos Bay, for example, score high, while Neah Bay scores low.

While this information is based on vessels that currently exist in the fishery (and in the longer run we would expect newer, more efficient vessels to be constructed), the initial state can have long term impacts. Ports with relatively efficient trawl vessels at the start of a rationalization program may end up better off than ports with relatively inefficient vessels. Appendix C, Tables 2 and 3, show that none of the trawl ports on the west coast have a fleet that is more than half comprised of efficient vessels; Coos Bay/Charleston has the most, at 48 percent of its fleet. However, merely comparing percentages of efficient and inefficient vessels is misleading, since the total number of vessels in a community's fleet also contributes to the overall score. For example, using a relative method, Neah Bay is the next most efficient, with 43 percent of its fleet passing the efficiency test. However, Neah Bay has only seven vessels making deliveries to the area in recent years (the actual number of vessels homeporting there is less) and minimal infrastructure, while Coos Bay has 27 vessels that have made deliveries and extensive infrastructure.

4.15.5.2 *Infrastructure*

The amount of agglomeration in shoreside business and infrastructure that exists in various ports has an effect on the longer-term ability of those ports to maintain fishing activity. Ports with larger degrees of agglomeration will be more able to attract and maintain fishing activity. From north to south, Bellingham, Seattle, Astoria, Newport, Coos Bay, Princeton/Half Moon Bay, San Francisco have high levels of infrastructure, with facilities such as cold storage and maintenance. Westport, Eureka, Crescent City, Fort Bragg, and Morro Bay, and Moss Landing have medium levels of infrastructure. Neah Bay and Brookings have low levels of commercial infrastructure.

4.15.5.3 *Proximity to Markets and Transportation*

The remoteness or connectedness of various ports to the market will alter the impacts of rationalization. Most coastal communities are fairly removed from major markets. Bellingham, Seattle, Fort Bragg, Moss Landing, Princeton/Half Moon Bay, and San Francisco are the most well-connected in terms of market proximity.

4.15.5.4 *Initial Allocation of Harvest Privileges*

The initial allocation of quota will favor some geographic areas over others. Using the initial allocation rules being considered, the graphs below show the amount of quota pounds that would be allocated to each port if existing harvest volumes are maintained.

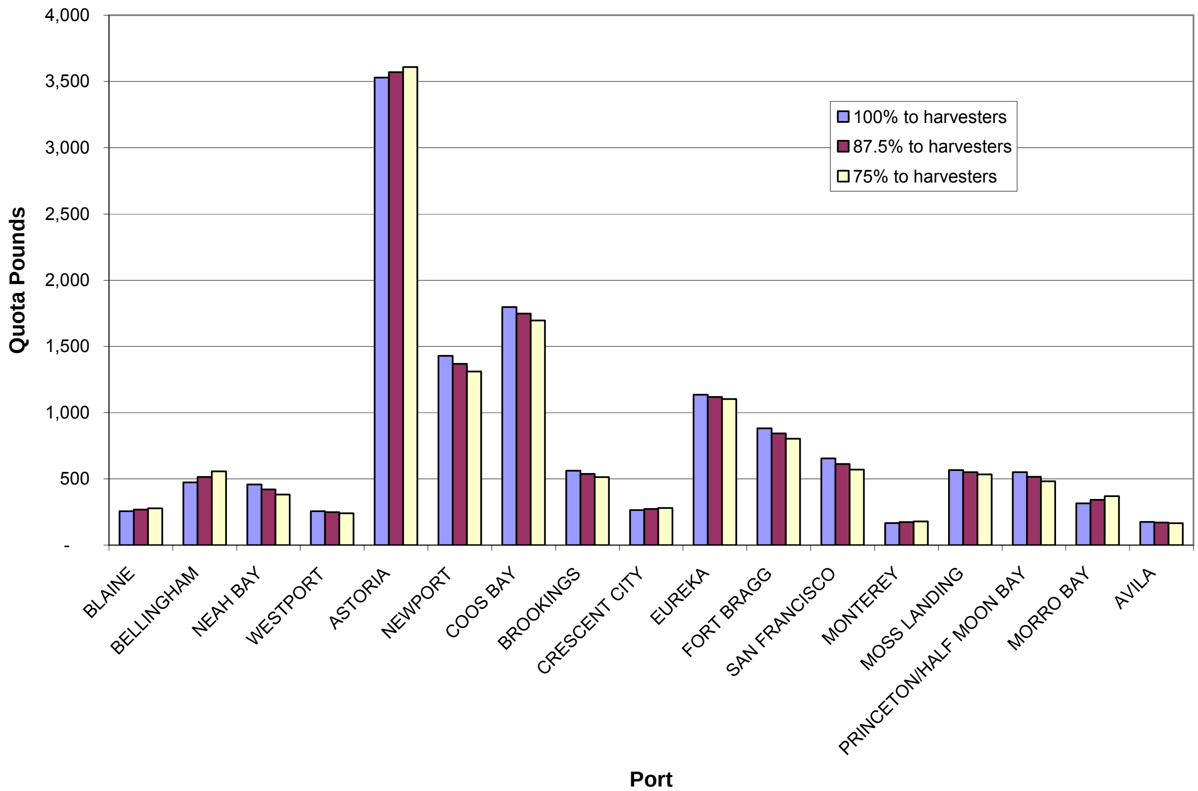


Figure 4–46. Non-whiting allocation with equal sharing of buyback history.

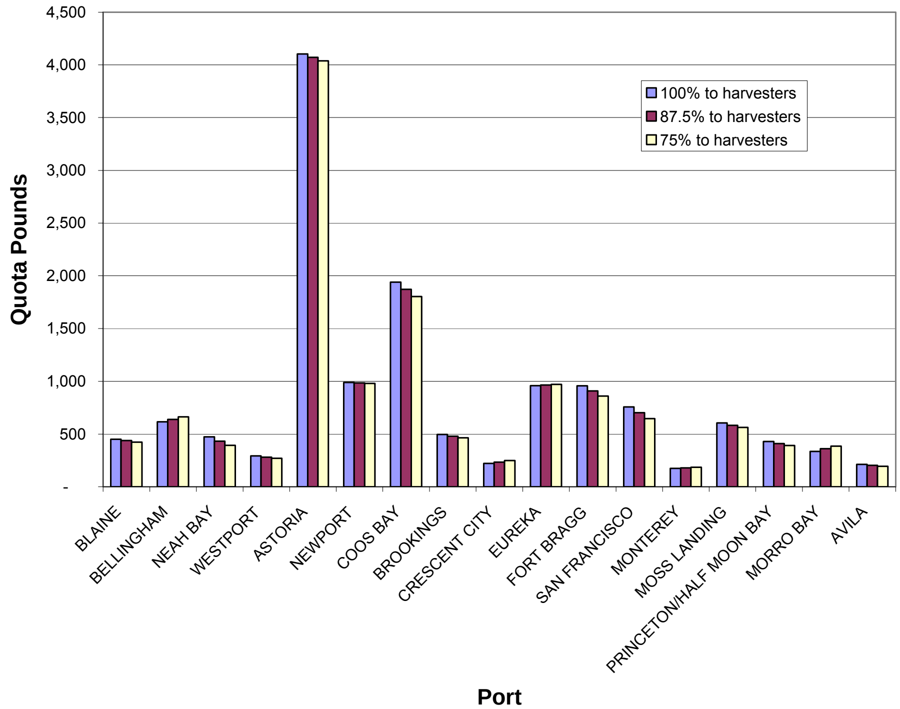


Figure 4–47. Non-whiting allocation based entirely on catch history.

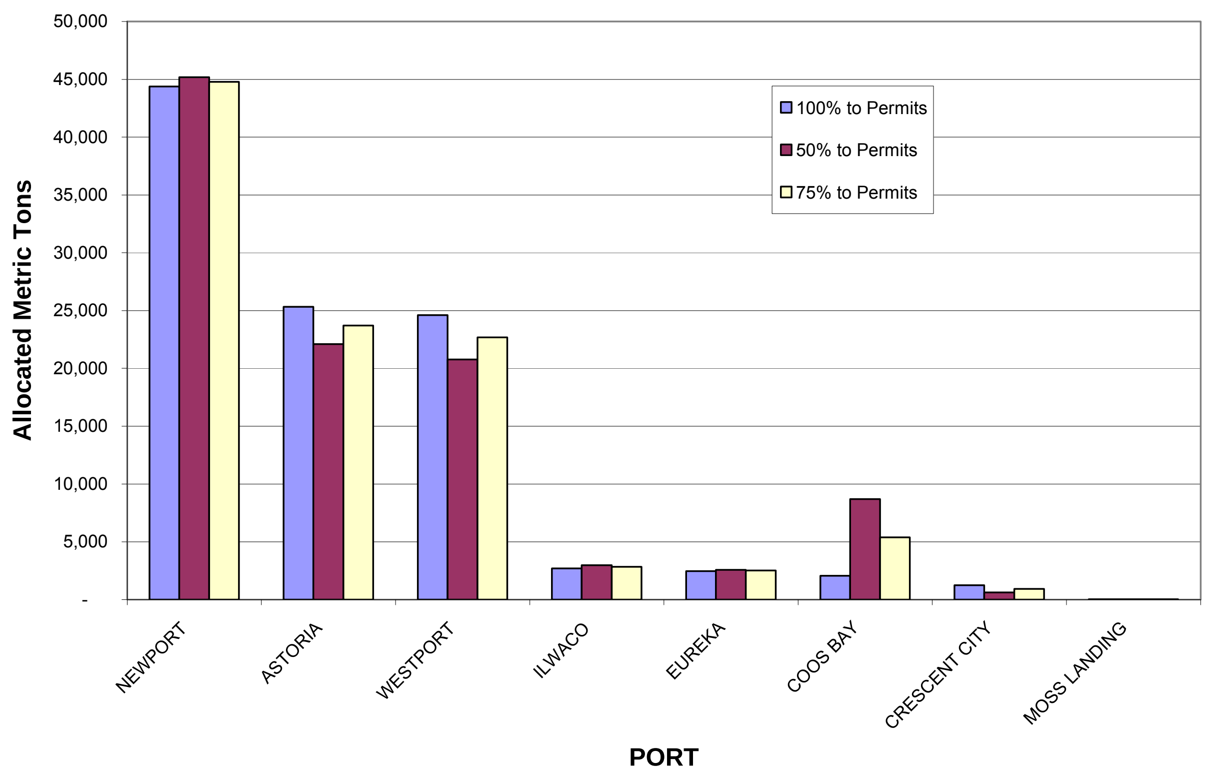


Figure 4–48. Shoreside whiting allocation based entirely on catch history.

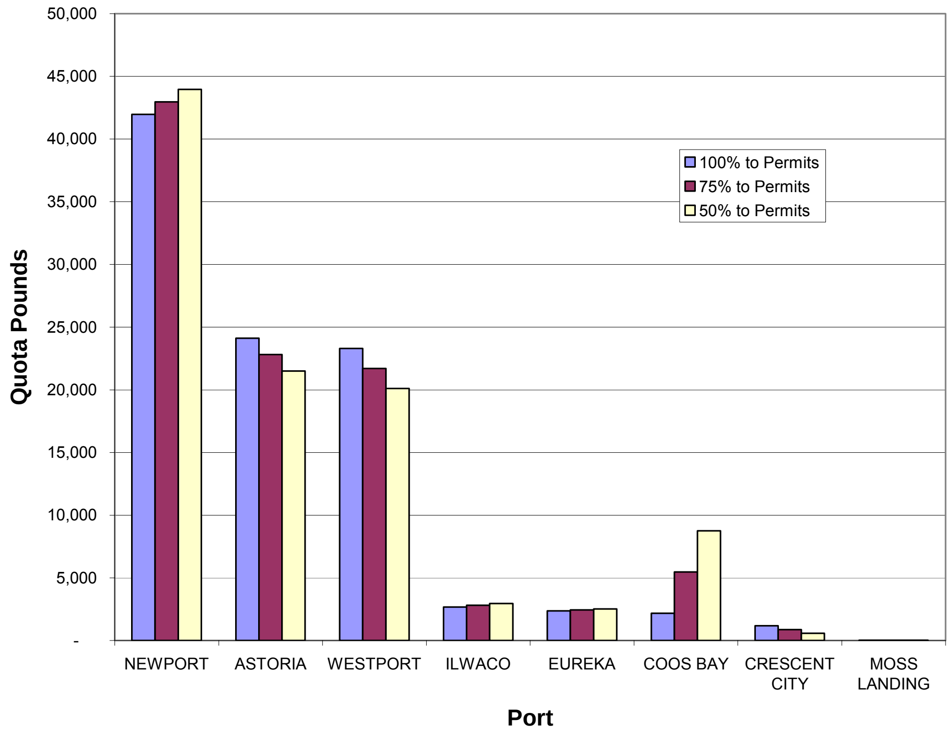


Figure 4–49. Shoreside whiting allocation with equal sharing of buyback history.

The figures above show that regardless of the type of initial allocation, a large share of quota will end up in specific ports. With equal sharing of buyback history (Figure 4-42), Astoria, Bellingham, Brookings, Coos Bay, Eureka, Fort Bragg, Newport, San Francisco, and Moss Landing should benefit from initial allocation of non-whiting quota share, regardless of the percentage of buyback quota allocated to harvesters. Princeton/Half Moon Bay may benefit, depending on the initial allocation rule. With non-whiting quota allocation based entirely on catch history (Figure 4-43), Astoria, Coos Bay and Bellingham benefit the most, regardless of the percentage of buyback quota allocated to harvesters. Newport, Astoria, and Westport all stand to benefit from the initial allocation of shoreside whiting (Figures 4-44 and 4-45).

Based on these data, combined with the weight of non-whiting groundfish landed by port and vessel efficiency category (Table 3, Appendix C), we established the following summary of relative comparative advantage for non-whiting trawl communities. In particular, the port of Neah Bay appears to be at a disadvantage in a rationalized fishery because of its lack of fleet efficiency, lack of shorebased infrastructure, and the high degree of dependence that vessels in this port have on areas defined as "high bycatch." Inversely, the ports of Astoria and Coos Bay appear to be at a relative advantage compared to other ports. Astoria has the benefit of a relatively efficient fleet, a relatively large presence of shorebased infrastructure, and a low dependence on fishing grounds located in high bycatch areas. Coos Bay also appears to be at a relative advantage because of fleet efficiency and the relatively large amount of shorebased infrastructure. While catch landed in Coos Bay has historically been caught in high bycatch areas, this amount of catch does not constitute the majority. Therefore, it is likely that vessels originating in Coos Bay will adjust fishing practices to avoid bycatch, but the community is not likely to suffer as a result.

Other communities are less certain. Bellingham and Half Moon Bay may see their vessels bearing a relatively high degree of constraint because of their reliance on fishing grounds in high bycatch areas. Vessels in Half Moon Bay are relatively less efficient, and while Bellingham has a number of vessels that fall within the efficient range, vessels from that area have a much longer travel distance to and from fishing grounds relative to vessels from other ports. This increases costs for these vessels relative to vessels from other ports, suggesting that they may be more appropriately categorized as inefficient.

The effect on Fort Bragg and Crescent City is also somewhat uncertain. While there are several scores that appear to work in Fort Bragg's favor, this community does not score in the top bracket on any of the determinant variables and may have a fleet comprised of inefficient vessels, though several vessels are near the efficient range. Crescent City scores in the negative category on several variables, and positively in others. The overall effect on Crescent City may depend on the relative importance of the variables. If bycatch dependency is the overall, driving factor, then Crescent City may actually be at an advantage even though it has a relatively inefficient fleet and a relatively small amount of quota initially allocated to it.

The table below summarizes expected impacts on nonwhiting communities. Ports that are at a disadvantage from consolidation and geographic shift are those whose vessels have a relatively long travel time to fishing grounds, those with relatively unsuccessful operators, costly vessels, and inefficiently-sized vessels (all included in "fleet efficiency" in the table below); those with insufficient infrastructure; and those that are adjacent to fishing grounds with high constraining overfished species abundance ("bycatch dependence" in the table below). The table also includes a positive or negative score for "initial allocation of groundfish," as determined by the initial allocation model described in Section 4.2.1.3. The implications of these scores for each community will be described further below.

Table 4-34. Comparative advantage of non-whiting trawl communities under rationalization

Port	Fleet Efficiency Score	Bycatch Dependent Area Score	Shorebased Infrastructure	Initial Allocation of Grndfish	Score
Bellingham	?	− −	+ +	+	
Neah Bay	−	− −	− −	−	−
Westport	−	+	+	−	
Astoria	+	+	+ +	+ +	+
Newport	+	−	+ +	+	
Charleston (Coos Bay)	+	+	+ +	+	+
Brookings	+	+	−	+	
Crescent City	−	+	+	−	
Eureka	+	+	+	+	+
Fort Bragg	−	+	+	+	
San Francisco	−	−	+ +	+	
Moss Landing	−	− −	+	+	
Princeton/Half Moon Bay	−	− −	+	+	
Morro Bay	?	+	−	−	

While this information suggests that shifts in fishing effort may occur as a result of rationalization with subsequent impacts to communities, these shifts can be mitigated or restricted to some degree by various aspects of the existing alternatives. The proposed rationalization program contains an option for area management that would create separate quota shares for north and south of 40°10'. In general, northern areas have received a larger share of trawl-caught groundfish during recent years and this appears to have been a pattern that could continue if the fishery is rationalized. Several large trawlers from the south have also relocated to the north, specifically Astoria. In addition, the geographic shift and regional comparative advantage analysis indicates northern communities have more factors working in their favor than southern communities. This may lead to a shift in fishing activity toward the north. Area management would presumably help retain catch in those southern communities. Adaptive management could be used to assist adversely impacted communities as well. Using the adaptive management in a manner that directs quota to specific communities that have demonstrated a harm, or a likely harm, could maintain fishing activity in a community that may otherwise stand to lose that activity.

Whiting communities are not as likely to see a shift in Pacific whiting fishing activity. This is because of resource access and access to infrastructure necessary to support a processing plant for Pacific whiting. Since the whiting fishery operates in northern California, Oregon, and Washington, community-based activity is not likely to deviate from communities in this area. In the shoreside whiting fishery, processors range from northern California to central Washington. The range is not expected to grow further since the fishery does not operate further south and also because of a lack of support infrastructure and fresh water north of Westport that would be necessary to support a large Pacific whiting processor. Therefore, while some redistribution of whiting activity may occur across communities currently engaged in the whiting fishery, it does not appear likely that there would be a wholesale shift in the location of where this activity takes place. The at sea fishery is an even more extreme example. Since entities involved in the whiting fishery also tend to be those in the Bering Sea Pollock fishery, many of these entities are based in the Puget Sound region of Washington. This is because of the travel distance to and from the Bering Sea (extending further south would mean more travel distance) and because of the amount of infrastructure and business in the Seattle area that can handle the needs of the at sea sector. Therefore, rationalization is not likely to influence the fact that the major centers for at sea whiting activity are in the Puget Sound area.

Resilience and Dependence

Knowing the resilience and dependence level of coastal communities helps to assess impacts from the trawl rationalization program. Impacts that may be minor to a very resilient community (like Seattle) could be substantial for a community with low resilience (like Neah Bay). Section 3.17 summarizes work done on dependence on the groundfish fishery and resilience in fishing communities for the 2007-08 groundfish harvest specifications {PFMC, 2006 1407 /id /ft ",, Appendix A, page A-86"}. The study uses as indicators the number of Federal and state groundfish permits in the community, number of commercial fishing vessels, revenue from fish landings, percentage of groundfish revenue as a percentage of total fisheries revenue, and number of processors and buyers to determine engagement and dependence on commercial fisheries. The study uses an industry diversity index, unemployment rate, percentage of population living below the poverty line, isolation of cities, and population density to determine resilience. The following table summarizes dependence and resilience of west coast trawl communities:

Most vulnerable communities (medium dependence on groundfish, least resilience)	
Neah Bay	Moss Landing
Relatively lower dependence, but low resilience	
Ilwaco	
Relatively higher dependence, medium resilience	
Bellingham	Crescent City
Astoria	Eureka
Coos Bay	Fort Bragg
Relatively higher dependence, higher resilience	
Newport	Morro Bay
Medium dependence but higher resilience	
Westport	
Relatively lower dependence and relatively higher resilience	
Warrenton	
Higher dependence, but high resilience (not considered "vulnerable")	
Brookings	San Francisco
Low dependence, high resilience (not considered "vulnerable")	
Anacortes	Hammond
Seattle	Half Moon Bay

As a reminder, the term "dependence" involves use of groundfish specifically, while "engagement," when used, refers to engagement in West Coast fisheries as a whole. In addition, the list above is slightly different than the list of trawl communities identified for this EIS. In our analysis, Astoria and Hammond are joined as one community. Coos Bay includes the port of Charleston.

The discussion below focuses on impacts from the options in the analytical scenarios to individual communities. The larger-scale impacts of rationalization discussed in detail in Section 4.15.2 also apply here, and when it is possible to differentiate among communities, relevant concerns are included below. It should also be noted that there are several options within the scenarios that do not vary by community. Each community would be affected equally (in proportion to its trawl activity) by tracking and monitoring provisions and carryover. Depending on how an adaptive management provision is administered, it could either benefit communities (by providing more quota) or adversely impact them by reducing the total available quota.

As discussed above, area management refers to the splitting of quota shares between the north and south. This could benefit central and southern California communities by maintaining more quota in the south.

The grandfather clause could also affect communities differentially. However, at this time there is insufficient data to determine how communities would be affected, and confidentiality issues would prevent a detailed discussion of individual community impacts.

4.15.5.5 *Washington*

Bellingham

Vulnerability	Vulnerable
Dependence on groundfish	Medium dependence
Resilience	Medium resilience
Population (2000)	67,171
Unemployment rate (2000)	10.3
Natural resources employment (2000)	0.9
Median household income (2000)	32,530
Percent below poverty level (1999)	20.6
Non-whiting groundfish trawl vessels (2005)	6
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	55.3
Groundfish processors (2006)	2
Federal trawl permits owned by community members (2007)	2 by 2 different owners
Vessels bought back in 2003 buyout	10

General

Bellingham is located on Bellingham Bay in north Puget Sound, in Whatcom County. The nearest major U.S. city is Seattle, a 90-mile drive south, while Vancouver, British Columbia, is a 54-mile drive north. Bellingham is a nonwhiting port.

Bellingham is considered vulnerable because it is highly engaged in Pacific fisheries in general, highly dependent on groundfish, and has medium resilience.

Bellingham has two processors that process groundfish landed in Bellingham Bay and Neah Bay. Bellingham also has access to a large seafood cold storage facility and has a relatively well-developed level of port infrastructure. Bellingham is located on the I-5 corridor, which enhances access to distribution facilities in the Seattle area.

The Comparative Advantage Model shows that 69.9 percent of Bellingham's non-whiting trawl catch occurs in an area identified as a high bycatch area. Yelloweye and canary rockfish are the main species of concern, and both are very constraining. Because of this, Bellingham vessels are relatively constrained compared to other ports. In addition, vessels from Bellingham have a much longer travel distance to and from fishing grounds compared to vessels from other ports. This increases cost for those vessels, suggesting that the four of eleven vessels that fall within the efficient range may be more appropriately categorized as inefficient. However, the efficiencies created by Bellingham's shorebased infrastructure help make up for the burden created by constraining bycatch species and lack of efficiency.

Effects of analytical scenarios

- Since Bellingham is a nonwhiting port, it would not be significantly affected by decisions relating to co-ops.
- The three or four sector issue would not impact Bellingham differently than other non-whiting communities, at least to a degree that can be identified at this time.
- Bellingham should benefit from initial allocation, particularly if 100 percent of the buyback history is equally allocated to harvesters.

- Bellingham has two processors that could benefit from initial allocation of IFQ to processors and processor linkages.
- Since Bellingham is close to a high bycatch area, it could be affected by the choice of which species to cover with IFQ, since harvesters would need a relatively large amount of quota for constraining species and would be at risk of a disaster tow.

Anacortes

Vulnerability	Not vulnerable
Dependence on groundfish	Low dependence
Resilience	High resilience
Population (2000)	14,557
Unemployment rate (2000)	5.1
Natural resources employment (2000)	2.3
Median household income (2000)	41,930
Percent below poverty level (1999)	7.7
Non-whiting groundfish trawl vessels (2005)	0
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	n/a
Groundfish processors (2006)	0
Federal trawl permits owned by community members (2007)	1
Vessels bought back in 2003 buyout	0

General

Anacortes, in Skagit County, is 80 miles north of Seattle and 40 miles southwest of Bellingham. Anacortes is primarily a whiting port; the at-sea whiting fleet docks there, and one at-sea whiting companies have their corporate headquarters in Anacortes. Perhaps because of this, commercial fishing in Anacortes has employed a low number of workers, but has paid some of the area's highest salaries. In 2000 the annual average wage for commercial fishermen in the county was $57,810. That year, the finfish fishery (which includes whiting) employed 53 workers making $83,016 annual average pay. And in the same year, only 91 Skagit County residents identified themselves as commercial fishermen.

Anacortes is not considered vulnerable. It is engaged in Pacific fisheries in general, but it is not considered dependent on groundfish and it is highly resilient.

Anacortes currently has no groundfish processors. Many seafood processors operating in the area have closed. However, several seafood companies from Western Washington come to Cap Sante Boat Haven to purchase product (not groundfish) from local fishermen.

Effects of analytical scenarios

- Anacortes' involvement in the trawl fishery is limited to the at-sea whiting fleet, specifically the catcher-processors sector.
- Unlike Bellingham, commercial groundfish vessels in Anacortes are not at a disadvantage due to their long travel time to fishing grounds or their proximity to the high bycatch area off northern Washington because they are primarily at-sea whiting vessels that are not tied to a specific geographic area.
- Since the community has no trawl groundfish processors and no Federal nonwhiting trawlers, it will only be affected by the scenarios as they pertain to the whiting fishery. Variations in the

way catcher-processor sector is managed are not expected to impact Anacortes because the effect of those variations on catcher-processors does not differ substantially from the status quo.

Seattle

Vulnerability	Not vulnerable
Dependence on groundfish	Low dependence
Resilience	High resilience
Population (2000)	563,374
Unemployment rate (2000)	5.1
Natural resources employment (2000)	0.3
Median household income (2000)	45,736
Percent below poverty level (1999)	11.8
Non-whiting groundfish trawl vessels (2005)	0
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	16
Groundfish processors (2006)	1
Federal trawl permits owned by community members (2007)	24, with 11 different owners
Vessels bought back in 2003 buyout	0

General

Seattle is on the east side of the Puget Sound between Elliot Bay and Lake Washington, in King County. According to the 2000 U.S. Census, Seattle's population was 563,374. The larger metropolitan area (comprising all or parts of Snohomish, King, Pierce, Thurston, and Kitsap Counties) was home to 3,554,760 in 2000.

Seattle is an important whiting port, with docks for the at-sea fleet and corporate headquarters. Most of the 24 Federal trawl permits owned in Seattle are used in the at-sea whiting fishery.

Although non-whiting permit holders live in Seattle, none actively fish out of Seattle, so Seattle's proximity to a high bycatch area is irrelevant.

In 2000 West Coast fisheries landings in Seattle were delivered by 909 unique vessels, including 253 commercial vessels, 498 tribal commercial vessels, and 158 personal use vessels. Nine vessels landed 109 mt of groundfish.

Seattle is not considered vulnerable. It is engaged in Pacific fisheries in general, but it is not considered dependent on groundfish and it is highly resilient. Seattle has a high level of fisheries infrastructure.

Effects of analytical scenarios

- Seattle is primarily an at-sea whiting port.
- It is too early to say how initial allocation might affect Seattle, and vessel efficiency data is not available for the at-sea fishery.
- The three or four-sector alternative should not significantly affect Seattle since Seattle does not have vessels actively engaged in shoreside fisheries.
- Seattle would not be affected by area management, since it is a whiting port and whiting are found in the north.
- Seattle could be affected by decisions regarding management of the mothership sector because of its engagement in the at-sea whiting fishery. Mothership sector co-op linkages or an initial allocation of whiting IFQ to motherships may affect companies differently than if such provisions do not exist. Variations in management of the catcher-processor sector are not expected to affect Seattle because the alternatives do not vary substantially from status quo.

- Seattle has several motherships that could benefit from initial allocation of IFQ to processors and processor linkages.

Neah Bay

Vulnerability	Vulnerable
Dependence on groundfish	Medium-low dependence
Resilience	Very low resilience
Population (2000)	794
Unemployment rate (2000)	24
Natural resources employment (2000)	17.9
Median household income (2000)	21,635
Percent below poverty level (1999)	29.9
Non-whiting groundfish trawl vessels (2005)	8
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	64.1
Groundfish processors (2006)	0
Federal trawl permits owned by community members (2007)	0
Vessels bought back in 2003 buyout	0

General

Neah Bay is at the northwestern-most point of the contiguous United States, across the Strait of Juan de Fuca from Vancouver Island, British Columbia. Situated in Clallam County, Neah Bay is the main settlement on the Makah Indian Reservation. The nearest major U.S. city is Seattle, a 165-mile drive and ferry ride southeast.

Neah Bay is considered quite vulnerable. It is not deeply engaged in Pacific fisheries in general, but it is dependent on groundfish and has very low resilience.

There are no known processing facilities of trawl groundfish in Neah Bay. Vessels deliver to buyers who subsequently deliver to processors in Seattle, Bellingham, Astoria, and elsewhere. Port and harbor facilities are limited, and the location is considered remote and removed from distribution and transportation networks. It is noteworthy that no federal trawl permits are owned by community members. Vessels fishing out of Neah Bay are owned by non-residents. As recently as 2005 there were eight vessels that made deliveries to Neah Bay, but anecdotal information indicates that many of these vessels have since left the business due to management restrictions. As of 2008, no trawlers are believed to be operating out of Neah Bay.

Effects of analytical scenarios

- Neah Bay is a small, vulnerable nonwhiting port that is at risk of losing its trawl fleet due to rationalization. Four of seven vessels delivering to Neah Bay in recent years are of “inefficient” size, and these four vessels constitute the majority of recent trawl landings.
- Neah Bay would not be affected by decisions regarding co-ops since it has no processors and no whiting fishery.
- Neah Bay does not benefit substantially from initial allocation, receiving less than the average allocated to all ports. Of the three buyback allocation options, Neah Bay would fare best under the 100 percent to harvesters option.

- Because Neah Bay has no permanent processors of trawl groundfish, it may experience a reduction in landings if processors are allocated quota. This is because it is likely that processors with quota will adjust operations so that ports where processing plants already exist have more landings.
- Vessels fishing out of Neah Bay are at a disadvantage because of its proximity to a high bycatch area. Of Neah Bay's non-whiting trawl catch, 95.5 percent occurs in an area identified as a high bycatch area, constrained by canary and yelloweye rockfish. Because of this, Neah Bay could be affected by the choice of which species to cover with IFQ, since harvesters would need a relatively large amount of (possibly expensive) quota for constraining species and would be at risk of a disaster tow.
- Neah Bay might benefit from having three, rather than four, trawl sectors. Since having three sectors enhances the pool of available quota to non-whiting harvesters (which includes all Neah Bay harvesters), three sectors would give them more ability to trade quota as necessary, while four sectors could inadvertently constrain them in some years if whiting bycatch is high.
- Of all communities, Neah Bay may benefit the most from an adaptive management provision to mitigate the impacts of rationalization.
- Although there has been a gradual shift in trawling to the north, trawl activity hasn't been moving to Neah Bay. However, area management could help because there would be less competition for the same fish and less risk of localized depletion.

Westport

Vulnerability	Vulnerable
Dependence on groundfish	Medium-low dependence
Resilience	High resilience
Population (2000)	2,137
Unemployment rate (2000)	7.5
Natural resources employment (2000)	10.8
Median household income (2000)	32,037
Percent below poverty level (1999)	14.3
Non-whiting groundfish trawl vessels (2005)	3
Whiting trawl vessels (2005)	8
Percentage of fishery revenue from groundfish (2005)	14.5
Groundfish processors (2006)	1
Federal trawl permits owned by community members (2007)	1
Vessels bought back in 2003 buyout	2

<u>General</u>

Westport is on the southernmost peninsula in Washington, Point Chehalis, in Grays Harbor County. The nearest major U.S. city is Seattle, a 130-mile drive northeast. Westport is primarily a whiting port, though two small nonwhiting vessels also deliver there.

Westport is considered vulnerable. It is deeply engaged in Pacific fisheries in general and is fairly dependent on the groundfish fishery, but it is also fairly resilient.

Westport has a single processor that processes trawl groundfish landed in the community. This facility concentrates primarily on Pacific whiting and is one of the largest shoreside processors for this species. Facilities near the Port of Grays Harbor include vessel fabrication services and supply centers. Westport is somewhat removed from distribution centers. Fish landed in Westport are also processed in Astoria and Ilwaco.

Effects of analytical scenarios

- Westport would be affected by options impacting whiting harvesters, nonwhiting harvesters, and processors. Processor ties in the shoreside whiting fishery could guarantee landings of whiting to Westport.
- Because of its involvement in Pacific whiting harvesting and processing activities, Westport would be affected by decisions relating to co-ops and processor ties, and initial allocation to harvesters and processors.
- Westport receives less non-whiting quota under the initial allocation options than the average allocated to all ports. Among the three buyback allocation options, Westport would fare best if buyback were allocated 100 percent to harvesters.
- Westport has one processor that could benefit from initial allocation of IFQ to processors and processor linkages.
- Since Westport is not close to a high bycatch area, it may not be substantially affected if constraining stocks are managed with IFQ.
- The non-whiting harvesters delivering to Westport are categorized as inefficient, meaning fleet consolidation may remove non-whiting activity from this port.
- Since Westport is engaged in both whiting and non-whiting activity, the decision to have three or four sectors will impact this port. The three-sector option will provide more flexibility since it expands the pool of quota available to harvesters in both sectors, making it more likely that expected harvest volumes will be reached.

Ilwaco

Vulnerability	Vulnerable
Dependence on groundfish	Low dependence
Resilience	Low resilience
Population (2000)	950
Unemployment rate (2000)	6.2
Natural resources employment (2000)	3.7
Median household income (2000)	29,632
Percent below poverty level (1999)	16.3
Non-whiting groundfish trawl vessels (2005)	0
Whiting trawl vessels (2005)	3
Percentage of fishery revenue from groundfish (2005)	14.7
Groundfish processors (2006)	1
Federal trawl permits owned by community members (2007)	0
Vessels bought back in 2003 buyout	0

General

Ilwaco is on the Long Beach Peninsula in southwest Washington. Situated in Pacific County, the community encompasses 2.06 square miles of land and 0.31 square miles of water. The nearest major U.S. city is Portland, Oregon, a 110-mile drive southeast, while Seattle is a 170-mile drive northeast. Ilwaco is primarily a whiting port.

Ilwaco is considered vulnerable. It is deeply engaged in Pacific fisheries in general, but it is not very dependent on groundfish. Ilwaco is fairly lacking in resilience.

Ilwaco has a relatively small but sufficient amount of infrastructure, with one processor, a marina, a fish wholesaler, and sources for fishing and marine supplies.

Effects of analytical scenarios

- Ilwaco is primarily a whiting port, and would be affected by options impacting the shoreside whiting fishery.
- Ilwaco receives less initial allocation of non-whiting groundfish than the average allocated to all ports. In addition, initial allocation reduces the amount of fish available to Ilwaco harvesters compared to status quo.
- Ilwaco has one processor that could benefit from initial allocation of IFQ to processors and processor linkages.
- Since Ilwaco's engagement in the groundfish trawl fishery is limited to shoreside whiting activity, establishing three or four sectors will impact the community. If four sectors are established, yet the shoreside whiting fishery is managed with co-operatives and shares bycatch limits with the at-sea sectors, a four-sector option may not constrain harvest activity. However, if four sectors are established and the shoreside whiting fishery is managed as its own sector with a specific allocation, harvest activity may be constrained during years when non-target catch is higher than anticipated. Managing the shoreside whiting fishery with three sectors is likely to provide more flexibility in prosecuting shoreside whiting activity since harvesters in both shoreside sectors can trade quota as necessary.

4.15.5.6 *Oregon*

Astoria/Warrenton

	Astoria	Warrenton
Vulnerability	Vulnerable	Not vulnerable
Dependence on groundfish	Relatively dependent	Low dependence
Resilience	Medium resilience	High resilience
Population (2000)	9,813	4,096
Unemployment rate (2000)	6.7	3.5
Natural resources employment (2000)	3.1	3.4
Median household income (2000)	33,011	33,472
Percent below poverty level (1999)	15.9	14.2
Non-whiting groundfish trawl vessels (2005)	29	
Whiting trawl vessels (2005)	5	
Percentage of fishery revenue from groundfish (2005)	31.9	
Groundfish processors (2006)	4	
Federal trawl permits owned by community members (2007)	17, with 14 different owners	
Vessels bought back in 2003 buyout	12	0

General

Astoria and Warrenton are adjacent to one another and are located in Clatsop County on the northwestern tip of Oregon, bordered by the Pacific Ocean on the west and the Columbia River on the north. Portland is the nearest major city, 91 miles to the east.

Astoria is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and it is relatively dependent on groundfish. Astoria has medium resilience. Warrenton is not considered vulnerable. It is not very engaged in Pacific fisheries, and not very dependent on groundfish. Warrenton is also fairly resilient.

Astoria has the benefit of a relatively efficient fleet, a relatively large presence of shorebased infrastructure, and a low dependence on fishing grounds located in high bycatch areas. However, Astoria is fairly removed from distribution centers.

Effects of analytical scenarios

- In general, Astoria is expected to benefit from rationalization, with a large initial allocation, and possibly increased harvesting and processing activity in the future as landed catch volumes in the non-whiting sector increases. Astoria/Warrenton would benefit the most from initial allocation of non-whiting quota relative to the average allocated to all ports, especially under the 100 percent buyback history to harvesters option.
- Both Astoria and Warrenton are whiting and non-whiting ports, and would be affected by options impacting whiting and non-whiting harvesters.
- Combined, Astoria and Warrenton have four processors that process trawl groundfish from Astoria, Aberdeen, Garibaldi/Tillamook, Neah Bay, Port Angeles, and Westport. In addition, several support businesses exist in the area and dock and harbor facilities are fairly well developed. Astoria/Warrenton could benefit from initial allocation of IFQ to processors and processor linkages.
- Since Astoria/Warrenton is not close to a high bycatch area, it would probably not be substantially affected by the choice to cover constraining stocks with IFQ.
- As with other communities that have both a whiting and non-whiting sector, establishing three or four trawl sectors may impact Astoria/Warrenton. If four trawl sectors are established, either shoreside sector may face difficulties prosecuting fishing activity if a species becomes unexpectedly constraining. Such difficulties may be felt in communities via a second-order effect on harvesters.

Newport

Vulnerability	Vulnerable
Dependence on groundfish	Relatively dependent
Resilience	High resilience
Population (2000)	9,532
Unemployment rate (2000)	9
Natural resources employment (2000)	3.8
Median household income (2000)	33,996
Percent below poverty level (1999)	14.4
Non-whiting groundfish trawl vessels (2005)	23
Whiting trawl vessels (2005)	12
Percentage of fishery revenue from groundfish (2005)	35.9
Groundfish processors (2006)	3
Federal trawl permits owned by community members (2007)	19, with 16 different owners
Vessels bought back in 2003 buyout	9

General

Newport is located in Lincoln County at the mouth of the Yaquina River. The northern portion of unincorporated South Beach is within the City of Newport's boundaries. The nearest major metropolitan area is Portland, 136 miles to the northeast. Newport is both a whiting and nonwhiting port.

Newport prides itself in and protects its “working waterfront,” realizing that the seafood industry is at the core of Newport’s history and culture. Tourism on the historic bayfront compliments its mixed use. While new revitalization plans have enhanced the local tourism economy, they have also increased tensions between the tourism and seafood industries.

Newport is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and very dependent on groundfish, but it is also fairly resilient.

In addition, several support businesses exist in the area and dock and harbor facilities are fairly well developed. Newport is fairly removed from distribution centers.

Effects of analytical scenarios

- In general, Newport is expected to benefit from rationalization, with a large initial allocation, and possibly increased harvesting and processing activity in the future as landed catch volumes in the non-whiting sector increases. Newport would receive more IFQ through initial allocation than the average allocated to all ports. Of the three buyback history distribution options, Newport benefits the most from the 87.5 percent to harvesters option.
- Newport is both a whiting and non-whiting port, and would be affected by options impacting whiting and non-whiting harvesters.
- Newport has three processing facilities engaged in trawl groundfish. Newport could benefit from initial allocation of IFQ to processors and processor linkages if doing so increases the likelihood that fishing activity will remain there.
- Newport is located near a high bycatch area (58.4 percent of its non-whiting trawl catch occurs in an area identified as a moderately high bycatch area). The species of concern are Pacific Ocean perch and darkblotched rockfish, which are less constraining than canary and yelloweye rockfish. Newport could therefore be affected by covering constraining species with IFQ. However, since the constraining species found off Newport are not as constraining as some, their presence may not have a substantial effect on Newport.
- As with other communities that have both a whiting and non-whiting sector, establishing three or four trawl sectors may impact Newport. If four trawl sectors are established, either shoreside sector may face difficulties prosecuting fishing activity if a species becomes unexpectedly constraining. Such difficulties may be felt in communities via a second-order effect on harvesters.

Coos Bay/Charleston

	Coos Bay	Charleston
Vulnerability	Vulnerable	Not vulnerable
Dependence on groundfish	Dependent	Dependent
Resilience	Medium resilience	Medium resilience
Population (2000)	15,374	n/a
Unemployment rate (2000)	5.4	n/a
Natural resources employment (2000)	3.6	n/a
Median household income (2000)	31,212	n/a
Percent below poverty level (1999)	16.5	n/a
Non-whiting groundfish trawl vessels (2005)	20	
Whiting trawl vessels (2005)	2	
Percentage of fishery revenue from groundfish (2005)	24.6	
Groundfish processors (2006)	4-5	
Federal trawl permits owned by community members (2007)	13, with 10 different owners	
Vessels bought back in 2003 buyout	8	0

General

Coos Bay and its port, Charleston, are located at the mouth of Coos Bay in Coos County, Oregon. Coos Bay is both a whiting and a nonwhiting port. Charleston, where most of the port activity takes place, is unincorporated. Coos Bay is located 226 miles south of Portland, on Highway 101, and 539 miles north of San Francisco.

Coos Bay is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and very dependent on groundfish, and it has medium resilience. Charleston is not considered vulnerable. It is not as engaged in Pacific fisheries or as dependent on commercial groundfish fisheries as Coos Bay (it scored higher on recreational measures, however); and it is considered resilient.

Several support businesses exist in the area and dock and harbor facilities are fairly well developed. However, Coos Bay is fairly removed from distribution centers.

Coos Bay appears to be at a relative advantage because of fleet efficiency and the relatively large amount of shorebased infrastructure.

Effects of analytical scenarios

- In general, Coos Bay and Charleston are expected to benefit from rationalization, with a large initial allocation, and possibly increased harvesting and processing activity in the future as landed catch volumes in the non-whiting sector increases. Coos Bay/Charleston would receive more IFQ than the average allocated to all ports. Of the three buyback history distribution options, Coos Bay/Charleston benefits the most from the 100 percent to harvesters option.
- Coos Bay/Charleston is both a whiting and non-whiting port, and would be affected by options impacting whiting and non-whiting harvesters.
- Coos Bay has five groundfish processors that process fish from Brookings and Newport as well as Coos Bay. Fish landed in the community are processed in the community, as well as in Newport and Santa Rosa. Coos Bay/Charleston could benefit from initial allocation of IFQ to processors and processor linkages if it increases the likelihood that processing activity will remain in those ports.

- While catch landed in Coos Bay has historically been caught in high bycatch areas, this amount of catch does not constitute the majority. Therefore, it is likely that vessels originating in Coos Bay will adjust fishing practices to avoid bycatch, but the community is not likely to suffer as a result.
- As with other communities that have both a whiting and non-whiting sector, establishing three or four trawl sectors may impact Coos Bay. If four trawl sectors are established, either shoreside sector may face difficulties prosecuting fishing activity if a species becomes unexpectedly constraining. Such difficulties may be felt in communities via a second-order effect on harvesters.

Brookings

Vulnerability	Not vulnerable
Dependence on groundfish	Relatively dependent
Resilience	High resilience
Population (2000)	5,447
Unemployment rate (2000)	5.8
Natural resources employment (2000)	5
Median household income (2000)	31,656
Percent below poverty level (1999)	11.5
Non-whiting groundfish trawl vessels (2005)	7
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	27.8
Groundfish processors (2006)	0
Federal trawl permits owned by community members (2007)	9, with 5 different owners (figures include Harbor)
Vessels bought back in 2003 buyout	6

General

Brookings, located in Curry County, is the southernmost coastal city of Oregon. It is situated at the mouth of the Chetco River, approximately 345 miles south southeast of Portland. According to the Port of Brookings-Harbor, it is the busiest recreational port on the Oregon coast with more than 95,000 anglers taking more than 31,000 trips.

Brookings is not considered vulnerable. It is quite engaged in Pacific fisheries in general, and very dependent on groundfish, but it is also considered very resilient. (It should be noted that Brookings depends heavily on the recreational salmon fishery, which was closed in 2008; therefore, it may be somewhat less resilient now than it was in the past).

Brookings is fairly removed from distribution networks. The fleet is characterized as relatively efficient because five vessels fall within the efficient category.

Effects of analytical scenarios

- Brookings is a non-whiting port, and would be affected by options affecting non-whiting harvesters, but not by options impacting whiting harvesters.
- Brookings would benefit slightly from initial allocation. Of the three buyback history distribution options, Brookings benefits the most from the 87.5 percent to harvesters option.
- Brookings has no known processing facilities of trawl groundfish. Groundfish landed in Brookings are processed in Eureka, Santa Rosa, and Charleston. Brookings may not see any benefit from initial allocation of IFQ to processors and processor linkages. In fact, such

processing linkages and initial allocation may draw trawl activity away form Brookings if processors elect to put that activity into ports where processing plants are located.

- Brookings is not adjacent to areas with high bycatch and would therefore not be substantially affected by covering constraining species with IFQ.
- The establishment of four sectors may make it difficult for non-whiting trawlers out of Brookings to acquire quota necessary to cover catch of some species if the catch of those species is higher than expected. Three trawl sectors would allow Brookings-based trawlers to trade quota with shoreside whiting trawlers, potentially alleviating these constraints.

4.15.5.7 *California*

Crescent City

Vulnerability	Vulnerable
Dependence on groundfish	Relatively dependent
Resilience	Medium resilience
Population (2000)	4,006
Unemployment rate (2000)	6.5
Natural resources employment (2000)	3.9
Median household income (2000)	20,133
Percent below poverty level (1999)	34.6
Non-whiting groundfish trawl vessels (2005)	5
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	19
Groundfish processors (2006)	0-1
Federal trawl permits owned by community members (2007)	4, with 3 different owners
Vessels bought back in 2003 buyout	16

General

Crescent City is in Del Norte County in northern California, approximately 330 miles south of Portland, Oregon, and 356 miles north of San Francisco. The Crescent City Harbor supports recreational and commercial fisheries, along with tourism. The harbor includes an ice plant, hoist, fuel supplier, boatyard, tackle shops, dry storage, marine supply store, vessel repair and maintenance, and other amenities.

The Groundfish Vessel Buyback Program and sales of other local vessels have removed many of the larger rent-paying vessels from the port. The absence of this revenue stream has reportedly caused an increase in rent. A new port master plan aims to attract shops and other business.

Crescent City is considered vulnerable. It is very engaged in Pacific fisheries in general, and quite dependent on groundfish, with medium resilience. In addition, Crescent City has been affected by the recent closure of the commercial and recreational salmon fishery.

Effects of analytical scenarios

- Crescent City is a whiting and non-whiting port, and would be affected by options impacting both whiting and non-whiting harvesters.
- Crescent City would receive an initial allocation that is less than average. Of the three buyback history distribution options, Crescent City benefits the most from the 75 percent to harvesters option.
- Crescent City has one processing facility that has engaged in minor quantities of trawl groundfish. Fish landed in Crescent City are also processed in Eureka, Fort Bragg, and San Francisco. Crescent City is fairly removed from distribution centers, but has several support businesses and infrastructure components.
- Crescent city scores in the negative category on several variables, but scores positively in bycatch dependency. The overall effect on Crescent City may depend on the relative importance of these variables. If bycatch dependency is the overall, driving factor, then

Crescent city may actually be at an advantage even though it has a relatively inefficient fleet and relatively small amount of quota initially allocated to it.

- The establishment of three or four trawl sectors would affect Crescent city similarly to other ports engaged in both non-whiting and whiting trawl fisheries. The establishment of four trawl sectors may make it difficult, in some instances, for harvesters to work around a species that has become unexpectedly constraining, while the establishment of three trawl sectors would allow harvesters in both shoreside trawl activities to trade quota, potentially alleviating this constraint.

Eureka

Vulnerability	Vulnerable
Dependence on groundfish	Relatively dependent
Resilience	Medium resilience
Population (2000)	26,128
Unemployment rate (2000)	9.7
Natural resources employment (2000)	3.2
Median household income (2000)	25,849
Percent below poverty level (1999)	23.7
Non-whiting groundfish trawl vessels (2005)	14
Whiting trawl vessels (2005)	3
Percentage of fishery revenue from groundfish (2005)	52.8
Groundfish processors (2006)	1
Federal trawl permits owned by community members (2007)	4, with 3 different owners
Vessels bought back in 2003 buyout	16

General

Eureka is the county seat of Humboldt County in northern California on Humboldt Bay south of Redwood National Park. San Francisco is 272.3 miles south. The economic base of Eureka was founded on fishing and timber. Commercial fishing has downsized in recent years and now the major industries are tourism and timber. Eureka is located on Humboldt Bay, the only deep water port between Coos Bay, Oregon, and San Francisco.

Eureka has one large processing facility engaged in trawl groundfish. This processor also processes fish landed in Bodega Bay, Brookings, Fort Bragg, San Francisco, and Crescent City. Fish landed in Eureka are also processed in Fort Bragg and Watsonville. Eureka's harbor facilities include berthing, dry storage, cold storage, a hoist, a boatyard, fuel facilities, ice, vessel repair and maintenance, electrical services, marine supplies, and other amenities.

Eureka is relatively removed from transportation networks and seafood distribution facilities.

Eureka is considered vulnerable. It is very engaged in Pacific fisheries in general, and very dependent on groundfish, with medium resilience. Like Crescent City, Eureka has been affected by the recent closure of the commercial and recreational salmon fishery.

Effects of analytical scenarios

- Eureka is both a whiting and non-whiting port, and would be affected by options impacting both whiting and non-whiting harvesters.
- Eureka would receive more IFQ under the initial allocation options than the average allocated to all ports. Of the three buyback history distribution options, Eureka benefits the most from the 87.5 percent to harvesters option.

- Harvesters based in Eureka do not regularly trawl areas defined as high bycatch. Therefore, covering constraining overfished species with IFQ is not likely to have a substantial impact on Eureka.
- The establishment of three or four trawl sectors would affect Eureka similarly to other ports engaged in both non-whiting and whiting trawl fisheries. The establishment of four trawl sectors may make it difficult, in some instances, for harvesters to work around a species that has become unexpectedly constraining, while the establishment of three trawl sectors would allow harvesters in both shoreside trawl activities to trade quota, potentially alleviating this constraint.

Fort Bragg

Vulnerability	Vulnerable
Dependence on groundfish	Dependent
Resilience	Medium resilience
Population (2000)	7,026
Unemployment rate (2000)	8.4
Natural resources employment (2000)	8.3
Median household income (2000)	21,587
Percent below poverty level (1999)	40.9
Non-whiting groundfish trawl vessels (2005)	10
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	40.6
Groundfish processors (2006)	1
Federal trawl permits owned by community members (2007)	8, with 6 different owners
Vessels bought back in 2003 buyout	5

General

Fort Bragg is in Mendocino County on northern California's Pacific Coast. The community is bordered on the north by Pudding Creek, which flows into the Pacific Ocean through a narrow inlet. Noyo Harbor is at the southern edge of the city. Noyo Bay provides a natural harbor and access to ocean fisheries.

Fishing has historically been, and remains, an important part of Fort Bragg's economy and community identity. Many boat owners offer private charter services for tourists and sport fishermen. In addition to salmon, commercial and recreational fisherman take rockfish, abalone, crabs, and mussels. Several festivals point to the city's dependence on fishing and logging. The city has two fish processors, a liquid fish fertilizer processing plant, and numerous businesses associated with fishing and coastal tourism. Harbor facilities include berthing, two hoists, dry storage, fuel, ice, marine supplies, vessel repair and maintenance, and other amenities.

Fort Bragg is considered vulnerable. It is very engaged in Pacific fisheries in general, and very dependent on groundfish, with medium resilience. As with other California and Oregon communities, Fort Bragg has been affected by the recent closure of the commercial and recreational salmon fishery.

Effects of analytical scenarios

- Fort Bragg is a non-whiting port, and would be affected by options impacting non-whiting harvesters, but not by options impacting whiting harvesters.
- While there are several scores that appear to work in Fort Bragg's favour, this community does not score in the top bracket on any of the variables used for indicating how this community may fare under rationalization. In addition, Fort Bragg has a fleet comprised of inefficient vessels, though several vessels are near the efficient range.
- Fort Bragg would receive more IFQ under the initial allocation options than the average allocated to all ports. Of the three buyback history distribution options, Fort Bragg benefits the most from the 87.5 percent to harvesters option.
- Fort Bragg has one known processing facility engaged in trawl groundfish. This processor also processes fish from Eureka and San Francisco, while fish from Fort Bragg are also processed in Eureka and Santa Rosa. Fort Bragg is relatively close to the distribution centers in San Francisco.
- Fort Bragg's vessels do not appear to rely on fishing grounds with a relatively high bycatch of constraining overfished stocks. Therefore, covering constraining overfished species with IFQ is not expected to substantially affect Fort Bragg.
- The three or four sector issue would not impact Fort Bragg differently than other non-whiting communities, at least to a degree that can be identified at this time.

San Francisco

Vulnerability	Not vulnerable
Dependence on groundfish	Relatively dependent
Resilience	High resilience
Population (2000)	776,733
Unemployment rate (2000)	4.6
Natural resources employment (2000)	0.1
Median household income (2000)	55,221
Percent below poverty level (1999)	11.3
Non-whiting groundfish trawl vessels (2005)	16
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	33.6
Groundfish processors (2006)	6
Federal trawl permits owned by community members (2007)	10, with 4 different owners; Nature Conservancy owns 7
Vessels bought back in 2003 buyout	1

General

San Francisco is located on the San Francisco Peninsula. A large and diverse city, San Francisco still has active commercial and recreational fisheries. San Francisco-area fisheries, like many West Coast fisheries, fluctuate depending on fisheries management decisions, ocean and weather cycles, and economic factors. Fishermen's Wharf is the traditional home of the fishing fleet and still serves commercial fishermen, although to a lesser extent than in the past; it is now primarily a tourist attraction. The Port of San Francisco provides berthing for commercial fishing boats at Fisherman's Wharf. The port offers full service ship repair, two dry docks, fuel, ice and other supplies, and numerous portside facilities. Additionally, the wharf's Pier 45 houses the West Coast's largest concentration of commercial fish processors and distributors. It is port policy that commercial fishing vessels have top priority for berths at the harbor. Many of the fishermen in the wharf community are not San Francisco residents due to San Francisco's high cost of living. Fishermen live in the nearby communities of East Bay, South Bay, Sonoma, Peninsula, and others.

San Francisco is not considered vulnerable. It is very engaged in Pacific fisheries in general, and its fisheries are quite dependent on groundfish, but it has very high resilience.

Effects of analytical scenarios

- San Francisco is a non-whiting port, and would be affected by options impacting whiting harvesters, but not by options affecting whiting harvesters.
- San Francisco would receive more IFQ through the initial allocation than the average allocated to all ports. Of the three buyback history distribution options, San Francisco benefits the most from the 100 percent to harvesters option.
- San Francisco has at least six processors engaged in trawl groundfish. These processors process fish from several ports in California. San Francisco has relatively developed port and harbor infrastructure. San Francisco is one of the primary distribution centers on the West Coast, meaning fishing-based activity may remain in this port under rationalized conditions.
- Vessels based in San Francisco are defined as inefficient, meaning fleet consolidation may remove trawl fishing activity from this port.
- Vessels based in San Francisco have historically fished in areas with a relatively high rate of overfished species bycatch. Therefore, covering overfished species with IFQ may negatively impact San Francisco-based trawlers.
- The three or four sector issue would not impact San Francisco differently than other non-whiting communities, at least to a degree that can be identified at this time.

Moss Landing

Vulnerability	Vulnerable
Dependence on groundfish	Somewhat dependent
Resilience	Low resilience
Population (2000)	300
Unemployment rate (2000)	17.4
Natural resources employment (2000)	9.6
Median household income (2000)	66,442
Percent below poverty level (1999)	18.8
Non-whiting groundfish trawl vessels (2005)	13
Whiting trawl vessels (2005)	1
Percentage of fishery revenue from groundfish (2005)	23
Groundfish processors (2006)	0
Federal trawl permits owned by community members (2007)	1
Vessels bought back in 2003 buyout	3

General

Moss Landing is in Monterey County on the eastern shore of Monterey Bay at the mouth of Elkhorn Slough. The community is 25.4 miles south of Santa Cruz and 95.8 miles south of San Francisco.

Fisheries in Moss Landing traditionally targeted sardines and other CPS species. After the sardine population collapsed, fishermen and buyers shifted their focus to anchovies, mackerel, and squid. Over time, fisheries for groundfish, halibut, spot prawn, crab, salmon, albacore, and other species developed at Moss Landing. Today Moss Landing Harbor is one of the largest commercial fishing ports in California. In 2001 it ranked third in pounds landed behind the Los Angeles and Ventura/Port Hueneme/Oxnard Harbor complexes, and fourth in ex-vessel revenues behind the San Francisco Bay area. Moss Landing Harbor, Woodward's Marine (a small supply/tackle store and fuel dock), a boatyard with travelift, a marine electrician, a marine diesel mechanic, a marine covers/upholstery shop, and a metal fabricator/welder provide fishing-related goods and services. Fish landed in Moss Landing are processed in San Francisco, Santa Rosa, Watsonville, and Hawaiian Gardens.

Moss Landing's economy is now based on commercial fishing, research, and recreation and tourism.

Moss Landing is considered vulnerable. It is quite engaged in Pacific fisheries in general, and somewhat dependent on groundfish, and it has very low resilience.

Effects of analytical scenarios

- Moss Landing is a non-whiting port, and would be affected by options impacting whiting harvesters, but not by options impacting whiting harvesters.
- Moss Landing would receive more IFQ during initial allocation than the average allocated to all ports. Of the three buyback history distribution options, Moss Landing benefits the most from the 100 percent to harvesters option.
- Because Moss Landing has no permanent processors of trawl groundfish, it may experience a reduction in landings if processors are allocated quota. This is because it is likely that processors with quota will adjust operations so that ports where processing plants already exist have more landings.
- The fleet based at Moss Landing is considered inefficient, meaning fleet consolidation may remove trawl fishing activity from this port.
- Vessels from Moss Landing have historically fished in areas defined as relatively high bycatch. Therefore, managing overfished species with IFQ may negatively impact Moss Landing.
- The three or four sector issue would not impact Moss Landing differently than other non-whiting communities, at least to a degree that can be identified at this time.
- Moss Landing might benefit from area management, since the gradual shift of trawl activity from south to north would be halted.

Princeton/Half Moon Bay

	Half Moon Bay	Princeton
Vulnerability	Not vulnerable	Not vulnerable
Dependence on groundfish	Low dependence	Low dependence
Resilience	High resilience	High resilience
Population (2000)	11,842	489
Unemployment rate (2000)	4	7.8
Natural resources employment (2000)	2.2	35.1
Median household income (2000)	78,473	40,417
Percent below poverty level (1999)	6.1	21.8
Non-whiting groundfish trawl vessels (2005)	11	
Whiting trawl vessels (2005)	0	
Percentage of fishery revenue from groundfish (2005)	23.1	
Groundfish processors (2006)	3	
Federal trawl permits owned by community members (2007)	4, with 3 different owners	
Vessels bought back in 2003 buyout	0	0

General

Princeton, also known as Princeton-by-the-Sea, is one of several unincorporated coastal communities south of San Francisco. It is 25 miles south of San Francisco and 44 miles northwest of San Jose. Half Moon Bay is located nearby. Princeton generally serves as the port for Half Moon Bay.

Neither Princeton or Half Moon Bay are considered vulnerable. As their relatively high median household income shows, both are quite well off, though Princeton also has a high percentage of residents whose income is below poverty level. Both communities' dependence on the groundfish fishery is low, and both are highly resilient.

Originally envisioned as an ocean resort, Princeton is now known principally for its harbor, Pillar Point. The land adjacent to Pillar Point is primarily industrial for boatbuilding and other marine-related industries. Pillar Point is a working fishing harbor with 369 berths. The harbor was constructed in 1961 and the inner breakwater was added in 1982. Pillar Point offers a modern fish dock, six-lane boat launch ramp, ice-making facility, and serves as a fish-buying hub for local commercial vessels.

Effects of analytical scenarios

- Princeton/Half Moon Bay is a non-whiting port, and would be affected by options affecting non-whiting harvesters, but not by options impacting whiting harvesters.
- The amount of IFQ allocated to entities active in the Princeton/Half Moon Bay area may be higher or lower than average, depending on the initial allocation formula. Of the three buyback history distribution options, Princeton/Half Moon Bay benefits the most from the 87.5 percent to harvesters option.
- Princeton and Half Moon Bay are located near a high bycatch area (94.7 percent of non-whiting trawl catch occurs in an area identified as a high bycatch area; the species of concern are cowcod and bocaccio). Therefore, management of overfished stocks with IFQ may negatively impact Princeton/Half Moon Bay.
- Vessels in Half Moon Bay are relatively inefficient, and therefore fleet consolidation may remove vessels from this port. However, the presence of shorebased infrastructure may make up for the burden created by constraining bycatch species and vessel inefficiency.
- Together, Princeton and Half Moon Bay have three processing facilities engaged in trawl groundfish, so these communities could benefit from processor allocations. These processors also process groundfish from Santa Cruz and Vallejo. Groundfish landed in Princeton/Half Moon Bay are also processed in Hawaiian Gardens, Santa Rosa, and El Granada.
- The three or four sector issue would not impact Princeton/Half Moon Bay differently than other non-whiting communities, at least to a degree that can be identified at this time.
- Princeton/Half Moon Bay might benefit from area management, since the gradual shift of trawl activity from south to north would be halted.

Morro Bay

Vulnerability	Vulnerable
Dependence on groundfish	Medium dependence
Resilience	High resilience
Population (2000)	10,350
Unemployment rate (2000)	2
Natural resources employment (2000)	3.7
Median household income (2000)	34,379
Percent below poverty level (1999)	13
Non-whiting groundfish trawl vessels (2005)	8
Whiting trawl vessels (2005)	0
Percentage of fishery revenue from groundfish (2005)	48.3
Groundfish processors (2006)	0
Federal trawl permits owned by community members (2007)	0
Vessels bought back in 2003 buyout	5

General

Morro Bay is considered vulnerable. It is quite engaged in Pacific fisheries in general, is very dependent on groundfish, but it also is very resilient.

In 2006, The Nature Conservancy purchased six federal trawling permits and four trawling vessels from commercial fishermen in Morro Bay. In addition to the six permits, the Conservancy purchased four trawling vessels and is exploring alternative uses for them. One vessel associated with the acquired trawling permits will remain with its current owner, who holds permits for other types of fishing. However, the vessel will be legally constrained from bottom trawling for groundfish in the future. Any fisherman who sells his permit to the Conservancy can not re-enter the trawl groundfish fishery.

There are currently no trawlers operating out of Morro Bay. For now, the Conservancy has shelved the permits and banked the harvest rights. In the future, however, it may lease back permits to central coast fishermen who would use more selective gear. Therefore, it is impossible to predict how efficient Morro Bay's future fleet may be, though Nature Conservancy materials suggest it is unlikely that much trawling will take place there.

Groundfish landed in Morro Bay are processed in San Francisco, Watsonville, Atascadero, and Avila. The town is relatively removed from distribution facilities, but infrastructure exists in the harbor area to support commercial fishing operations.

Effects of analytical scenarios

- Morro Bay is a non-whiting port, and would be affected by options affecting non-whiting harvesters, but not by options impacting whiting harvesters.
- Morro Bay would receive less during initial allocation of IFQs than the average allocated to all ports. Of the three buyback history distribution options, Morro Bay benefits the most from the 75 percent to harvesters option.
- Because Morro Bay has no permanent processors of trawl groundfish, it may experience a reduction in landings if processors are allocated quota. This is because it is likely that processors with quota will adjust operations so that ports where processing plants already exist have more landings.

- Since Morro Bay is a nonwhiting port, it would not be significantly affected by decisions relating to co-ops.
- The three or four sector issue would not impact Morro Bay differently than other non-whiting communities, at least to a degree that can be identified at this time.
- Morro Bay might benefit from area management, since the gradual shift of trawl activity from south to north would be halted.

4.15.6 Comparative Summary

Scenario 1	• Continued depressed status of communities reliant on fishing
Scenario 2	• Fleet consolidation leading to fewer vessels in each port and potentially fewer ports with vessels • Ports with active vessels may benefit from healthier status of remaining vessels • Processor consolidation in whiting fishery, potentially impacting specific communities if plants close • Expansion of processing activity in non-whiting sector leading to more processing activity in the aggregate. • Shift in landing and processing activity in non-whiting industries from south to north. Shift in landing and processing activity on a localized scale
Scenario 3a	• Fleet consolidation leading to fewer vessels in each port and potentially fewer ports with vessels • Ports with active vessels may benefit from healthier status of remaining vessels • Processor consolidation in whiting fishery, potentially impacting specific communities if plants close • Expansion of processing activity in non-whiting sector leading to more processing activity in the aggregate. • Less geographic shift in activity due to the use of adaptive management for adversely impacted processors
Scenario 3b	• Fleet consolidation leading to fewer vessels in each port and potentially fewer ports with vessels • Ports with active vessels may benefit from healthier status of remaining vessels • Processor consolidation in whiting fishery, potentially impacting specific communities if plants close • Expansion of processing activity in non-whiting sector leading to more processing activity in the aggregate. • Different geographic shift in harvesting and processing activity than 3a or 2 – more shift toward processors with quota.
Scenario 4	• Fleet consolidation leading to fewer vessels in each port and potentially fewer ports with vessels • Ports with active vessels may benefit from healthier status of remaining vessels • Processor consolidation in whiting fishery, potentially impacting specific communities if plants close • Expansion of processing activity in non-whiting sector leading to more processing activity in the aggregate. • Less geographic shifts in fishing and processing activity at a large scale. Some geographic shifts at a localized scale
Scenario	• Fleet consolidation leading to fewer vessels in each port and potentially fewer ports with

5	vessels • Ports with active vessels may benefit from healthier status of remaining vessels • Processor consolidation in whiting fishery, potentially impacting specific communities if plants close • Expansion of processing activity in non-whiting sector leading to more processing activity in the aggregate. • Less geographic shifts in fishing and processing activity at a large scale. Some geographic shifts at a localized scale

4.16 Groundfish Resources

Table 4-35 provides an overview of the analytical approach used to compare baseline and future conditions of the groundfish stocks under the alternatives. The analytical approach includes 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) the significance criteria or thresholds.

Table 4-35. Overview of analytical approach used to compare baseline and future conditions of the groundfish resource under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes individual species stock abundance	Changes in amount of target species catch	Stock assessment outputs	Stock assessments
Changes in regional abundance of individual species stocks	Shifts in location of catch	Fishing concentration and likelihood of localized depletion; Avoidance of certain bycatch species by harvesters	Qualitative assessment

The change in condition of the groundfish resource was not substantially different under any of the analytical scenarios. Therefore, the change in condition of the groundfish resource will be evaluated through a comparison of the condition under status quo management versus the condition under a quota share-based management program.

4.16.1 Broad-Level Effects of Rationalization on Groundfish Stocks

Groundfish stocks are expected to be primarily, but not substantially, affected by rationalization through changes in the amount of target species that are harvested. Currently harvest of target species is lower than the allowable harvest amount because the harvest limit of associated bycatch species is reached before the target species can be fully captured. For example, many more tons of Dover sole could be caught in the current bottom trawl fishery, if only the harvest of associated canary rockfish could be reduced or avoided. It is anticipated that rationalization would allow fishermen the time and incentive to avoid the take of canary rockfish, thereby allowing more time and opportunity to harvest larger amounts of target species. That increased amount of target catch cannot be predicted because it depends on the collective behavior of a sector; however, it is possible to suppose several scenarios of increased target catch based on how well fishermen avoid limited bycatch species.

Secondarily, the groundfish resource may be regionally affected, but not significantly, by rationalization due to shifts in harvest location. Such shifts may be due to changes in the vessel homeport and processor delivery locations. Shifts may also be due to the proposed requirement that quota shares be caught in a particular management area, such as either north or south of a commonly used management line at 40° 10' latitude.

Lastly, there will be improvement in the fishery dependent data used in many species stock assessments due to the increase in observer coverage, from status quo (20-30 percent observer coverage on bottom trawl vessels) to rationalized management (100 percent observer coverage or as close to 100 percent as is reasonable). More data would decrease one source of uncertainty in stock assessment models that comes from catches that are not fully accounted for. By decreasing uncertainty, decision makers can put greater confidence in the stock assessment model, make more informed risk assessments, and better management decisions. The mere presence of complete observer coverage may also influence vessel and crew behavior by discouraging high grading or illegal discard, discouraging fishing in illegal areas, and encouraging avoidance of sensitive species and habitats.

4.16.2 Potential Impacts, Mechanisms, and Metrics

The following metrics were utilized to examine the potential impacts of rationalization on groundfish stocks in comparison to status quo management.

Change in the amount of target species catch: Trawl rationalization is anticipated to result in an increased amount of target species catch. This greater utilization of high-yield species could have impacts on individual stocks of groundfish. This potential impact was evaluated by applying several possible catch amounts to a species stock assessment model. Each target species that could experience an increased catch amount was examined for the predicted biological responses in spawning stock biomass and the management thresholds governing the status of groundfish stock health.

Regional Shifts in Catch: Trawl rationalization is anticipated to result in geographic changes in harvest patterns, and consequently, the potential for localized depletion of some groundfish stocks. These changes could have an effect on stocks that are limited in range, do not range extensively to breed, or have little larval dispersion. To examine this impact, the model described in Section 4.2.1.3 and Appendix C is used, illustrating the predicted geographic shifts in fishing patterns. This is combined with a qualitative discussion addressing possible impacts of geographic shifts in fishing activity and the implications of an area management provision.

There are some legitimate concerns that the implementation of a TIQ program could result in the spatial concentration of fishing effort. Over larger spatial scales, such issues speak not only to the potential impacts of localized depletion, but to issues of equity with respect to historical exploitation rates and subsequent allocation of allowable catches. The Cape to Cape group suggested that management of west coast fisheries would benefit by matching the spatial scales of interest for coastal communities with those scales naturally found within marine ecosystems. The evidence reviewed in that statement suggests while nearshore ecosystems exhibit marked regional differences in their species composition, dynamics and productivity, and the specialization of associated fishery, offshore ecosystems (particularly the slope ecosystem and species) tend to have more population connectivity and more homogenous distribution and life history characteristics. Yet even at a coastwide scale, spatial differences in fishing mortality can lead to altered perceptions of stock status depending on the spatial scale at which a given stock is assessed. For example, sensitivity analysis of different stock boundaries for the shortspine thornyhead stock assessment in 2006 demonstrated that overall depletion and status was considerably more optimistic with a coastwide assessment relative to an assessment that only included the four International North Pacific Fisheries Commission (INPFC) areas north of Cape Mendocino.

4.16.3 Effects of the Alternatives

4.16.3.1 *Change in the amount of target species catch*

In order to analyze the effects of a rationalized fishery versus the status quo fishery, several different levels of catch were examined against the status quo catch amounts. The analysis below shows the biomass/depletion/status of various groundfish species as the mortality of those stocks varied by catch scenario. Scenario 1 was the least optimistic, or the lowest increase in catch above the status quo catch. Scenario 2 was the middle range. And Scenario 3 was the most optimistic and represents the largest catch increase presumed to occur under rationalization.

Table 4-36. Predicted mortality scenarios expected in a rationalized fishery.

	Prior to rationalization	Catch scenario 1		Catch scenario 2		Catch scenario 3	
	Total mortality (mt)	Total mortality (mt)	Relative change	Total mortality (mt)	Relative change	Total mortality (mt)	Relative change
Sablefish	5933.8	5933.8	0.00%	5933.8	0.00%	5933.8	0.00%
Chilipepper	127.5	127.5	0.00%	2000.0	1468.63%	2000.0	1468.63%
Longspine	838.0	2250.5	168.56%	2250.5	168.56%	2250.5	168.56%
Shortspine	904.0	1841.3	103.69%	1841.3	103.69%	1841.3	103.69%
Dover sole	6500.0	12032.47	85.11%	12032.5	85.11%	16500.0	153.85%
Arrowtooth	2913.3	4942.9	69.67%	4942.9	69.67%	4942.9	69.67%
Petrale	2440.0	2440.0	0.00%	2440.0	0.00%	2440.0	0.00%
Other flatfish	1562.0	3170.0	102.94%	4970.0	218.18%	4970.0	218.18%
Yellowtail	618.0	618.0	0.00%	618.0	0.00%	1000.0	61.81%
Slope rockfish	382.0	731.2	91.41%	1200.0	214.14%	1200.0	214.14%
Dogfish shark	450.0	450.0	0.00%	450.0	0.00%	450.0	0.00%
Pacific cod	400.0	723.4	80.85%	1200.0	200.00%	1200.0	200.00%
Lingcod	671.0	671.0	0.00%	815.0	21.46%	1000.0	49.03%
Pacific whiting	242950.0	242950.0	0.00%	242950.0	0.00%	242950.0	0.00%

Catch of several stocks were not anticipated to change from status quo levels, including sablefish, Petrale sole, dogfish shark, and Pacific whiting, and therefore were not analyzed further. Some stocks with anticipated increased catch (other flatfish, slope rockfish, and Pacific cod) did not have a prior stock assessment; therefore the catch predictions and the effect on stock biomass could not be analyzed. Lingcod and yellowtail rockfish stock assessment models were not able to effectively incorporate the mortality predictions as provided, and could not be analyzed for the effects of the three catch scenarios. It should be noted, however; the OYs for lingcod and yellowtail rockfish were not exceeded in any of the scenarios. Four species managed under rebuilding plans – Pacific Ocean perch, darkblotched rockfish, widow rockfish and bocaccio – had anticipated catch increases under the rationalization catch scenarios, but no catch levels would exceed the mortality allowed in the respective rebuilding plans.

Under a rationalized fishery the levels of mortality several stocks – chilipepper rockfish, arrowtooth flounder, Dover sole, longspine thornyhead, shortspine thornyhead, yellowtail rockfish, and lingcod – are expected to increase, and therefore the biomass of those stocks is anticipated to change. For those species, the three catch scenarios were applied to the stock assessment models to show how increased mortality levels may impact those spawning stock biomasses. None of the post-rationalization catch scenarios, when applied to the stock assessment model, resulted in a fishing mortality rate that reduces the spawning stock biomass below 40 percent of virgin biomass, the management threshold set by the Council to maintain fish stock abundance.

For practicability purposes, the analysis simulates the various catch scenarios within the assessments as if rationalization were to take place in 2008. While rationalization is not expected to be implemented until 2011, the dates covered in the simulations are still representative of what would occur with changes in the mortality of the various species.

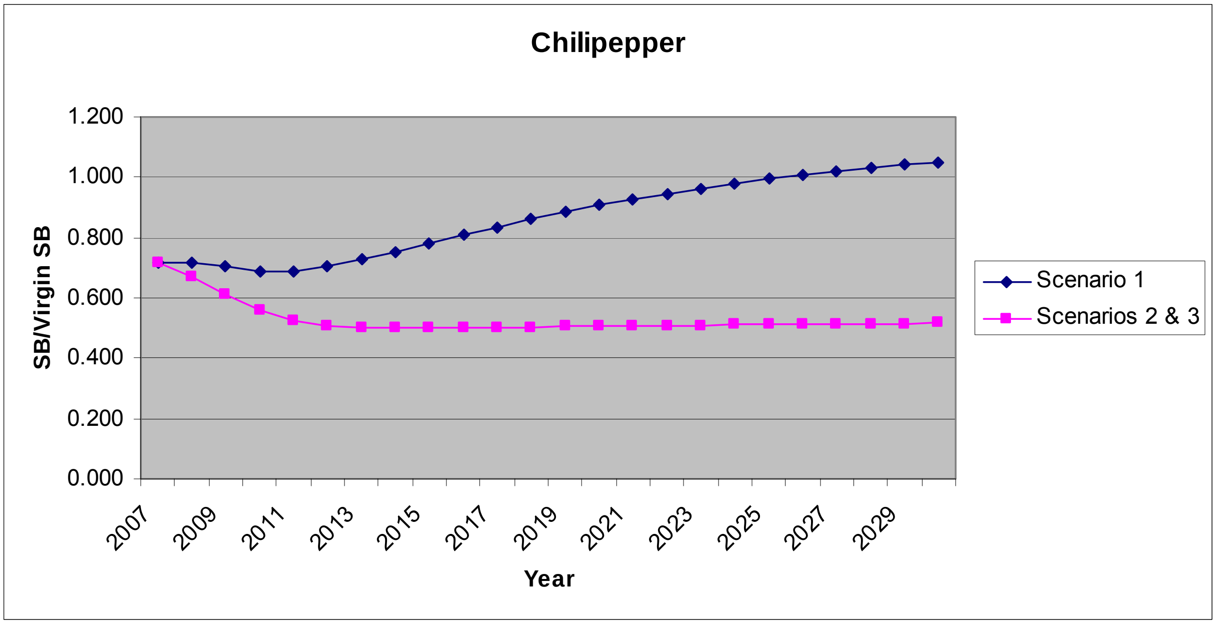


Figure 4–50. Percent of unfished spawning biomass predicted – chilipepper.

The percent of unfished spawning biomass for chilipepper rockfish is lower under catch scenarios 2 and 3, which are the medium and high range post-rationalization catch predictions. None of the catch scenarios allow the fishing mortality rate to dip much below $F_{60\%}$, which is above the management threshold of $F_{40\%}$.

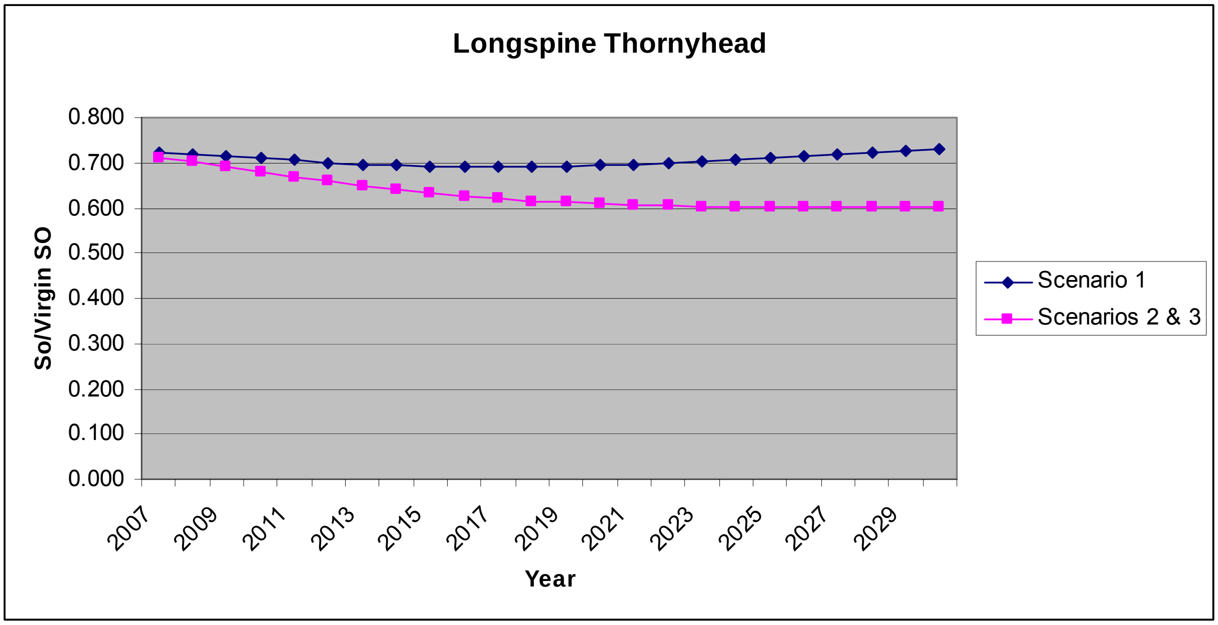


Figure 4–51 Percent of unfished spawning biomass predicted – longspine thornyhead.

The percent of unfished spawning biomass for longspine thornyhead is lower under catch scenarios 2 and 3, which are the medium and high range post-rationalization catch predictions. None of the three catch scenarios allow the fishing mortality rate to dip much below $F_{60\%}$, which is above the management threshold of $F_{40\%}$.

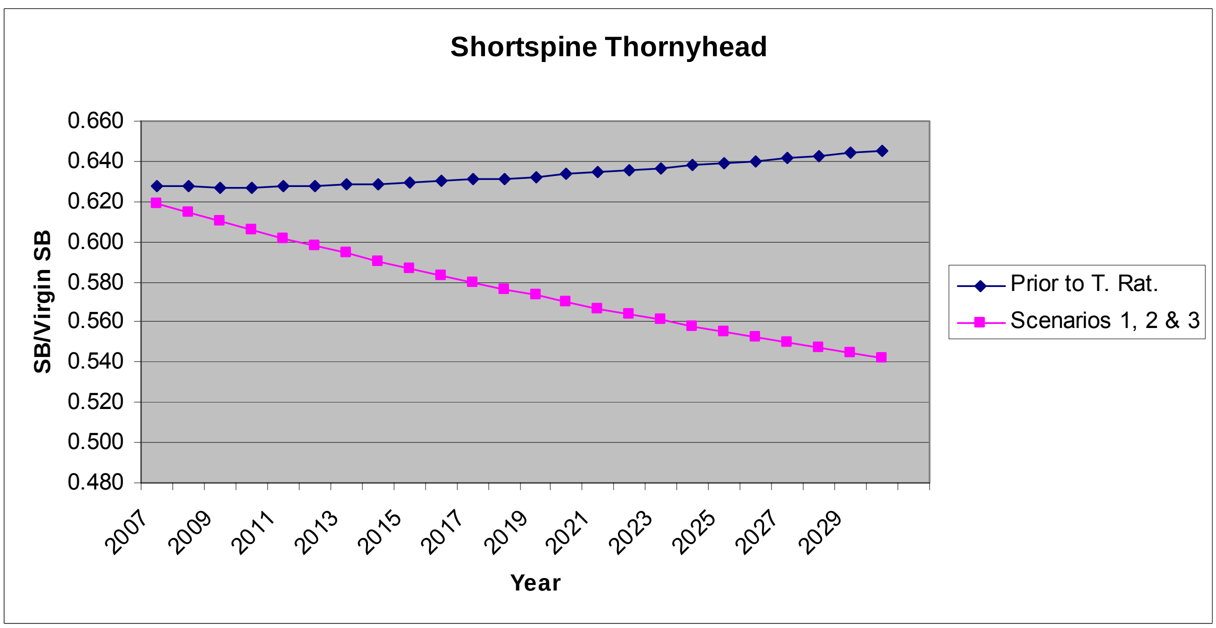


Figure 4–52 Percent of unfished spawning biomass predicted – shortspine thornyhead.

The percent of unfished spawning biomass for shortspine thornyhead decreases and is obviously different from the predictions under status quo management. However, the decrease is gradual over 20 years and does not dip below the fishing mortality rate of $F_{50\%}$. The fishing mortality rates of the three rationalization catch scenarios do not differ.

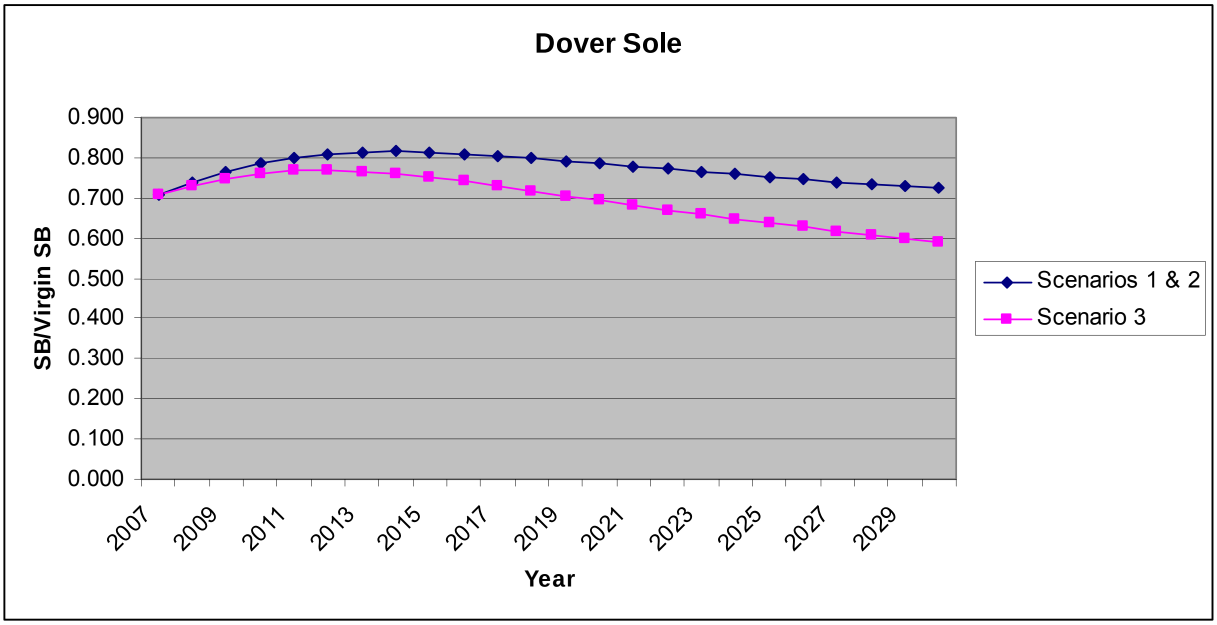


Figure 4–53 Percent of unfished spawning biomass predicted – Dover sole.

The percent of unfished spawning biomass for shortspine thornyhead is lower under catch scenario 3, which is logical, since scenario three is the most optimistic (highest) fishing mortality prediction of all the scenarios. None of the catch scenarios allow the fishing mortality rate to dip much below $F_{50\%}$, which is above the management threshold of $F_{40\%}$.

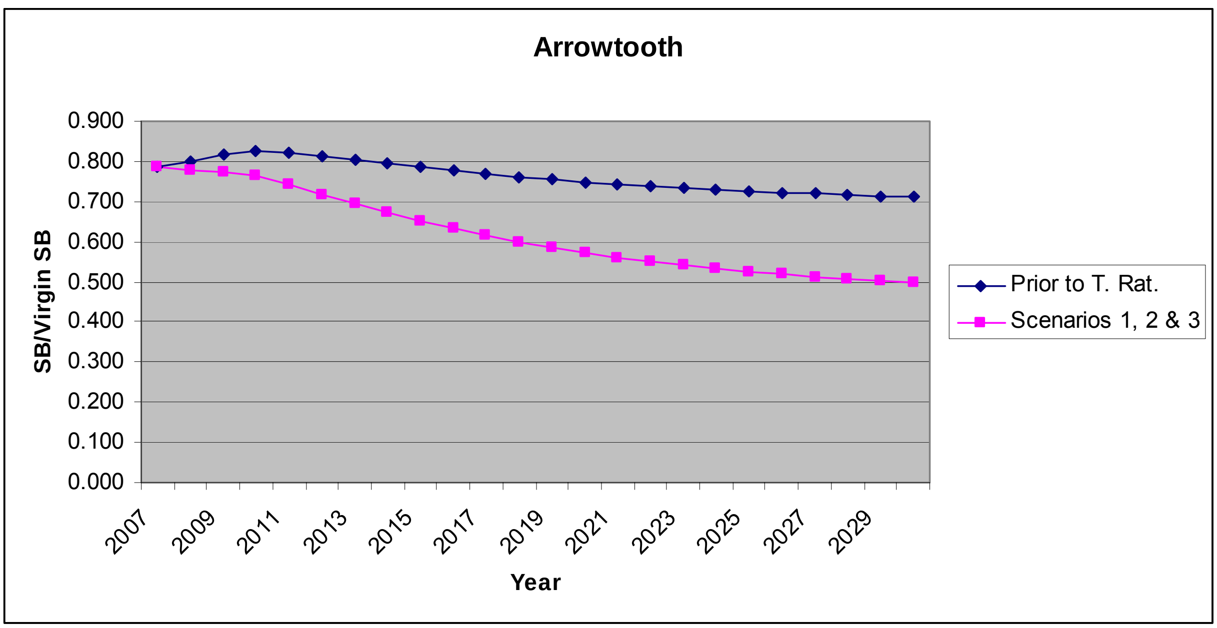


Figure 4–54 Percent of unfished spawning biomass predicted – Arrowtooth flounder.

The percent of unfished spawning biomass for arrowtooth flounder in a rationalized fishery decreases over 20 years and is lower than spawning stock biomass predictions under status quo management. However, the decrease does not dip below the fishing mortality rate of $F_{50\%}$. The arrowtooth flounder fishing mortality rates from the three rationalization catch scenarios do not differ.

4.16.3.2 *Regional Shifts in Catch*

In general, rationalization is expected to focus fishing effort around certain ports. Appendix C describes the causes of this shift in fishing concentration, noting in particular the incentive to avoid constraining species (canary, yelloweye, and cowcod) as a driving factor. Harvesters are predicted to modify gears and fish in areas where overfished species are less abundant. Appendix C describes the results of this predicted avoidance behavior by showing the areas most likely to be fished by the bottom trawl sector, and the predicted shift northward for whiting harvest.

The spatial concentration of fishing effort in certain locations has the potential for causing localized depletion. On a coastwide scale the occurrence of localized depletion, in theory, should have little impact on the health of a stock, depending on life history characteristics. Because stock assessment and management is on such a large spatial scale, a drop in abundance of a species in a small area may be considered more of a community or economic issue rather than biological. The influence localized depletion has on stock health depends on stock structure, life history and distribution. Additionally, at a coastwide scale, spatial differences in fishing mortality can lead to altered perceptions of stock status depending on the spatial scale at which a given stock is assessed. For example, sensitivity analysis of different stock boundaries for the shortspine thornyhead stock assessment in 2006 demonstrated that overall depletion and status was considerably more optimistic with a coastwide assessment relative to an assessment that only included the four International North Pacific Fisheries Commission (INPFC) areas north of Point Conception.

If an area management provision is established, rationalization may require quota shares to be fished either north or south of 40 degree 10 minutes north latitude to prevent excessive consolidation of fishing mortality into a geographic area. The range of stocks does not necessarily match up to the north-south management line or the coastwide management strategy. Given that the current broad-scale management approach likely falls short of addressing the spatial structure of some fish populations, a system that makes fishing effort even more fluid (rationalization) has the potential to exacerbate this situation. Concentration of quota shares in a region might, therefore, have unforeseen biological consequences.

4.16.4 Cumulative Effects of the Alternatives

4.17 ESA-listed Salmon

Chinook salmon take in the groundfish 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.

One provision of the alternatives that may influence the bycatch of salmon is the presence of an adaptive management provision. Depending on the goals of the adaptive management program, the program could be used to encourage the development of gears and fishing practices that reduce the bycatch of salmon. It is not clear how effective the use of the adaptive management provision could be in reducing salmon bycatch, but it is likely that some reduction in salmon bycatch would be possible.

4.17.1 Potential Impacts, Mechanisms, and Metrics

Amendment 20 may result in temporal and spatial changes to the harvest of groundfish; and therefore may result in potential changes to the interception of salmon by both the whiting and non-whiting fisheries. However; a quantitative assessment of how the number of salmon bycatch in the whiting trawl fishery will change is not predictable.

Table 4-37 [37]. Overview of analytical approach used to compare baseline and future conditions of the salmon resource under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes in amount of salmon bycatch species caught	Changes in the temporal and spatial aspects of fishing, changing interception of salmon	Count of individual salmon caught by trawlers each year	Observer data; Qualitative Assessment

4.18 Protected Species Other than ESA-listed Salmon

NMFS Northwest Region Sustainable Fisheries Division has initiated a Section 7 consultation with the U.S. Fish and Wildlife Service (for seabirds) and NMFS Protected Resources Division to determine whether the proposed action is likely to jeopardize the continued existence of any ESA-listed species. As more information becomes available during the early consultation stages this section will be updated.

4.19 California Current Ecosystem

A description of the California Current large marine ecosystem can be found in Chapter 3 of this document. Analysis of this environmental component is still under development.

4.19.1 Broad-Level Effects of Rationalization on the California Current Ecosystem

The California Current large marine ecosystem is not predicted to be substantially impacted by rationalization, although it is difficult to make predictions about a complicated system that has many inputs to productivity. Changes in catch, induced by moving from status quo management to share-based management, may result in changes to the ecosystem's foodweb that are perceptible. Changes in location of catch and changes in the type of gear utilized may result in changes to the amount and kind of essential fish habitat impacted. Such changes in habitat impacts may have an effect on the ecosystem, however; that link, while logical is tenuous to prove out, as noted in the EFH EIS {PFMC, 2004 1452 /id}. Direct effects of fishing are most accurately captured in projections from single species stock assessments, which are evaluated in Section 4.16.

Indirect effects that could occur include keystone predation (predator indirect increases the abundance of competitor of its prey via consumption of the prey); tri-trophic interactions (increase in plant/algal abundance caused by the control of herbivores by prey); exploitation completion (a reduction in a consumer or producer resulting from the reduction of its prey or resources by another consumer species); apparent competition (reduction of a species resulting from increase in a second species that enhances predation by a shared enemy); indirect mutualism (positively correlated changes in two species resulting from predation by each on the competition of the other's main prey); indirect commensalism (similar to indirect mutualism but one potential indirect mutualist is more generalized in diet and also feed on the main prey of the other indirect mutualist); habitat facilitation (one organism indirectly improves the habitat of a second by altering the abundance of a third interactor); apparent predation (an indirect decrease in a non-prey produced by a predator or herbivore, e.g. a predator removes a prey species and the decline of the prey results in the decline of a third species); and indirect defense (the indirect reduction of a predator or herbivore by a non-prey, for example, competition by a non-prey can reduce the abundance of a prey and this its predator) {Menge 1997}.

4.19.2 Potential Impacts, Mechanisms, and Metrics

Table 4.38 provides an overview of the analytical approach used to compare baseline and future conditions of the California Current large marine ecosystem under the alternatives, including essential fish habitat (EFH). The analytical approach includes 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) the significance criteria or thresholds.

Table 4-38 [38]. Overview of analytical approach used to compare baseline and future conditions of the ecosystem under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes species abundance	Changes in catch that can be traced through the foodweb	Changes in predator and prey abundance and trophic relationships	Atlantis ecosystem model
Changes in fishing effects (and area management) on EFH	Shifts in location of catch and gear switching	Description of changes in area and duration of bottom contact of groundfishing gears	Geographic shift model & Qualitative assessment

Change in the Catch Amount of Target Species and Key Predator/ Prey Species:

Shifts in Fishing Locations as Pertaining to EFH: Trawl rationalization is anticipated to result in geographic changes in harvest patterns, and consequently, the potential for changes in impacts to EFH. Trawling occurs over hard or soft substrates, and general shifts in fishing location would translate to either an increase or a decrease of trawl in the EFH areas defined in Appendix C. No change in trawled substrate type would occur in areas that are currently closed to trawling, because no changes are anticipated to Rockfish Conservation Areas or other EFH conservation measures. To examine this impact, the model described in Section 4.2.1.3 will be used to illustrate the predicted geographic shifts in fishing patterns. This will be paired with either a hard or soft bottom substrate type, which was obtained from the 2004 EFH EIS {PFMC, 2004 1452 /id}. A qualitative discussion will follow, indicating whether that area will see an increase, decrease or no change to fishing effort and therefore gear contact with bottom habitat.

Shifts in Gear Types as Pertaining to EFH: Trawl rationalization is also anticipated to result in opportunity to switch from trawl gear to fixed-gear, which is thought to be less destructive on bottom habitat. One specific provision of Amendment 20, Adaptive Management, could provide an incentive to switch from bottom trawl to fixed gears, which would have implications on EFH conservation.

4.19.3 Effects of the Alternatives

4.19.3.1 *Change in the Catch Amount of Target Species and Key Predator/ Prey Species*

Analysis forthcoming

4.19.3.2 *Shifts in Fishing Locations as Pertaining to EFH*

In order to determine what impacts would occur to habitat from changing to rationalized fishery management from status quo, the areas fished were looked at (before and after rationalization) and which habitat types occurred in those areas. The following table shows the delineated bycatch areas (GeoHab Areas) and the amount and percentage of each polygon that is associated with either a hard or soft substrate.

Table 4-39 [39]. Induration composition of bycatch polygons (areas in hectares).

GeoHab Area	blank	hard	soft	Grand Total	blank	hard	soft
34d 25' to EEZ-S, in	2,299.2	1,075.9	32,335.6	35,710.8	6.44%	3.01%	90.55%
34d 25' to EEZ-S, out	3,835.2	29,239.7	397,093.6	430,168.6	0.89%	6.80%	92.31%
36d 08' to 34d 25', out	448.8	20,598.4	87,574.6	108,621.8	0.41%	18.96%	80.62%
38d 25' to 36d 08', in	15.1	6,602.4	94,296.3	100,913.8	0.01%	6.54%	93.44%
38d 25' to 36d 08', out		1,173.4	46,749.1	47,922.6	0.00%	2.45%	97.55%
40d 10' to 38d 25', in	2.6	313.3	33,576.3	33,892.2	0.01%	0.92%	99.07%
40d 10' to 38d 25', out		0.4	43,328.4	43,328.7	0.00%	0.00%	100.00%
42d 30' to 40d 10', in	7.8	936.6	46,729.3	47,673.6	0.02%	1.96%	98.02%
42d 30' to 40d 10', out		3,608.3	71,790.0	75,398.3	0.00%	4.79%	95.21%
43d 55' to 42d 30', in	2.6	3,509.9	25,919.8	29,432.3	0.01%	11.93%	88.07%
43d 55' to 42d 30', out		2,522.6	31,957.3	34,479.8	0.00%	7.32%	92.68%
45d 35' to 43d 55', in	0.8	8,592.8	50,657.3	59,250.9	0.00%	14.50%	85.50%
45d 35' to 43d 55', out		2,083.2	49,890.0	51,973.2	0.00%	4.01%	95.99%
47d 40' to 45d 35', in	0.5	528.4	80,676.3	81,205.2	0.00%	0.65%	99.35%
47d 40' to 45d 35', out		1,910.9	54,552.3	56,463.2	0.00%	3.38%	96.62%
EEZ-N to 47d 40', in	6.0	356.3	28,610.5	28,972.8	0.02%	1.23%	98.75%
EEZ-N to 47d 40', out			19,169.2	19,169.2	0.00%	0.00%	100.00%
Grand Total	6,618.7	83,052.6	1,194,905.8	1,284,577.1	0.52%	6.47%	93.02%

The polygons highlighted in grey are those areas that are predicted to experience a decrease in fishing effort (see Section 4.2.1.3 and Appendix C for the geographical shift model description), and therefore a decrease in trawl gear contact with the bottom. In four areas (grey rows in Table 4-39), the majority (88 percent to 98.7 percent) of the substrate is soft bottom.

All other polygons (white rows in Table 4-39) may or may not have a complementary increase in trawl fishing effort after the implementation of trawl rationalization. It is difficult to determine which areas may have an increase in trawl effort. It is important to note that impacts to EFH from trawl gear have been mitigated by past Council actions and are ongoing.

4.19.3.3 *Shifts in Gear Types as Pertaining to EFH*

Gear switching may reduce the impacts to habitat that is currently trawled, however since many types of habitat are not accessed by trawl gear because of footrope restrictions (such as rocky reef habitat), gear switching may result in more fishing effort being exerted on untrawlable habitat. It is unclear what the effect would be from an increase in fixed gear fishing effort on untrawlable habitat.

4.19.4 Cumulative Effects of the Alternatives

CHAPTER 10 ACRONYMS AND GLOSSARY

Acronym	Definition
ABC	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).
AFSC	National Marine Fisheries Service Alaska Fisheries Science Center
APA	Administrative Procedures Act
B_{MSY}	The biomass that allows maximum sustainable yield to be taken.
BO	Biological opinion
BRD	Bycatch reduction device.
CBP	(Zip)code business patterns
CCA	Cowcod Conservation Area(s)
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CFGC	California Fish and Game Commission
CFR	Code of Federal Regulations.
Council	Pacific Fishery Management Council
CPFV	Commercial passenger fishing vessel (charter boat)
CPS	Coastal pelagic species.
CPUE	Catch per unit of effort.
CRCA	California Rockfish Conservation Area.
CRFS	California Recreational Fisheries Survey
CV	Coefficient of variation
DEIS	Draft Environmental Impact Statement
DRCA	Darkblotched Rockfish Conservation Area

Acronym	Definition
DTL	Daily-trip-limit
DTS	Dover sole, thornyhead, and trawl-caught sablefish complex
EA	Environmental assessment
EEZ	Exclusive Economic Zone.
EFH	Essential fish habitat.
EFP	Exempted fishing permit.
EIS	Environmental impact statement.
ENSO	*El Niño* Southern Oscillation.
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act.
ESU	Evolutionarily significant unit
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 “instantaneous” 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).
FEAM	Fishery economic assessment model.
FEIS	Final Environmental Impact Statement
FMP	Fishery management plan.
F_{MSY}	The fishing mortality rate that maximizes catch biomass in the long term.
FMU	Fishery management unit
FONSI	Finding of no significant impact.
FR	Federal Register.
GAP	Groundfish Advisory Subpanel.
GDP	Gross Domestic Product
GFA	Groundfish Fishery Area
GIS	Geographic Information System
GFA	Groundfish fishing areas
GMT	Groundfish Management Team.
GPS	Global Positioning System
HAPC	Habitat areas of particular concern.
HG	Harvest guideline(s).

Acronym	Definition
HMS	Highly migratory species.
IFQ	Individual fishing quota.
IMPLAN	IMpact Analysis for PLANning - a regional economic impact model
INPFC	International North Pacific Fishery Commission.
IPHC	International Pacific Halibut Commission.
IRFA	Initial regulatory flexibility analysis.
LE	Limited entry fishery.
M	Instantaneous rate of natural mortality (as opposed to F, fishing mortality)
MBTA	Migratory Bird Treaty Act
MFMT	Maximum fishing mortality threshold.
MMPA	Marine Mammal Protection Act.
MPA	Marine protected areas
MRFSS	Marine Recreational Fisheries Statistics Survey.
MSA	Magnuson-Stevens Fishery Conservation and Management Act.
MSST	Minimum stock size threshold.
MSY	Maximum sustainable yield.
NAICS	North American Industry Classification System
NEPA	National Environmental Policy Act.
NERR	National Estuarine Research Reserves
NGO	Non-government organization
NMFS	National Marine Fisheries Service.
NOAA	National Oceanic & Atmospheric Administration. The parent agency of National Marine Fisheries Service.
NOI	Notice of intent
NRDC	Natural Resource Defense Council
NSG	National Standards Guidelines.
NWR	National Marine Fisheries Service, Northwest Region
ODFW	Oregon Department of Fish and Wildlife
OFWC	Oregon Fish and Wildlife Commission
ORBS	Oregon Recreational Boat Survey
OY	Optimum yield
PacFIN	Pacific Coast Fisheries Information Network. Provides commercial fishery information for Washington, Oregon, and California. Maintained by the Pacific States Marine Fisheries Commission.

Acronym	Definition
PDO	Pacific decadal oscillation.
P_{MAX}	The estimated probability of reaching $T_{MAX.}$ May not be less than 50%.
POP	Pacific ocean perch. A rockfish species that was declared overfished in 1999.
PRA	Paperwork Reduction Act
PSMFC	Pacific States Marine Fisheries Commission.
QSM	Quota species monitoring.
RCA	Rockfish Conservation Area
RCG	Rockfish, cabezon, and greenlings. A species grouping used in the management of California recreational fisheries.
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.
RFA	Regulatory Flexibility Analysis, or Regulatory Flexibility Act.
RIR	Regulatory Impact Review.
RLMA	Rockfish/lingcod Management Area
ROD	Record of Decision
SAFE	Stock assessment and fishery evaluation.
SCTA	Southern California Trawlers Association
SFA	Sustainable Fisheries Act of 1996. Amended the MSFCMA.
SHOP	Shoreside Hake Observation Program
SPR	Spawning biomass per recruit
SSC	Scientific and Statistical Committee.
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.
SWOP	Shoreside Whiting Observer Program
TAC	total allowable catch
TIQ	Trawl Individual Quota
$T_{F=0}$	The median time to rebuild a stock if all fishery-related mortality were eliminated beginning in 2007.
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).

Acronym	Definition
TNC	The Nature Conservancy
T_{TARGET}	The target year, set by policy, for a fish stock to be completely rebuilt.
U/A	Usual and accustomed (usually used when referring to tribal fishing, hunting or gathering areas)
UASC	United Anglers of Southern California
USFWS	U.S. Fish and Wildlife Service. A representative of USFWS is a non-voting member of the Council.
VMS	Vessel monitoring system.
WCGOP	West Coast Groundfish Observer Program
WDFW	Washington Department of Fish and Wildlife. A representative of WDFW sits on the Council.
WDNR	Washington Department of Natural Resources
WSPRC	Washington State Parks and Recreation Commission
WOC	Washington, Oregon and California
YRCA	Yelloweye Rockfish Conservation Area

EXCERPT FROM THE ANALYSIS

APPENDICES A (EXCERPTS), B AND C

OF

RATIONALIZATION OF THE PACIFIC COAST GROUNDFISH LIMITED ENTRY TRAWL FISHERY

PRELIMINARY DRAFT ENVIRONMENTAL IMPACT STATEMENT

INCLUDING
REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

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APPENDIX A: ANALYSIS OF COMPONENTS, ELEMENTS, AND OPTIONS FOR THE IFQ ALTERNATIVE

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A-2 IFQ System Details

A-2.1 Initial Allocation and Direct Reallocation

Under the Sustainable Fisheries Act, Councils developing IFQ programs were required to take into account an NRC study on the topic (NRC, 1999). The NRC recommended that "the councils consider a wide range of initial allocation criteria and allocation mechanisms in designing IFQ program . . . " and more broadly consider ". . . (1) who should receive initial allocation, including crew, skippers, and other stakeholders (councils should define who are included as stakeholders); (2) how much they should receive; and (3) how much potential recipients should be required to pay for the receipt of initial quota (e.g.,, auctions, windfall taxes)." (NRC 1999) (pg. 203). Councils should "avoid taking for granted the option of 'gifting' quota shares to the present participants in the fishery, just as they should avoid taking for granted that vessel owners should be the only recipients and historical participation the only measure of what each deserves. Councils should consider using auctions, lotteries, or a combination of mechanisms to allocate initial shares of quota" (NRC 1999) (pg. 207). This section covers the topics raised by the NRC, with the exception of the NRC question on the amount that initial recipients might pay to receive there initial IFQ allocation (see Sections A-2.3.2 and A-6). Specifically, this section covers the following issues related to initial allocation of IFQ as quota shares (QS):

> Initial Recipients vs. Eligible to Own
>
> The question "Who should be eligible to receive an initial allocation of IFQ?" is separate from a similar question "Who should be eligible to acquire IFQ after the initial allocation?" The latter question is covered in Section A.2.2.3. The initial allocation does not tell us which groups (permit owners, crew, processors communities or others) will come to hold the initial allocation over the long run.

Eligible Groups

- What groups will be eligible to receive an initial allocation of QS (A-2.1.1.a)?
- How much of the initial allocation will go to each group (A-2.1.1.a)?
- What criteria must be met for membership in each group and how might the attributes that meet those criteria be passed on or accrue to successors in interest (A-2.1.1.b, c, and d)?

Recent Participation

- Should more recent activity or membership in the group be required to receive an initial allocation? (A-2.1.2.a, b, and c)

Allocation Formula

- What amounts of QS should be allocated to each of those qualifying for an initial allocation? (A-2.1.3, a, b, c, and d) The following are considered in addressing this allocation question:
    - Should there be an equal allocation element in the allocation formula?
    - Should there be a catch history element in the allocation formula?
    - What time periods should be used for allocation?
    - Should the allocation formula take hardships into account?
    - Should the same credit be received for a given amount of catch, regardless of the year in which it is harvested?
    - Should all species be allocated on the same basis?

Exceptional Situations

- With respect to the allocation formulas, what provisions can be developed to address classes of exceptional situations (e.g., credit for EFP landings in excess of trip limits)? (A-2.1.4)

Appeals

- What process should be provided to address disagreements about applications of the provisions and unusual situations that may arise that are not otherwise addressed? (A-2.1.5)

Direct Reallocation after Initial Issuance

- If after QS is issued direct reallocation appears to be needed to address the redefinition of a management units[1] or if there is a substantial changes in the status of a species, how would those reallocations be achieved? (A-2.1.6)

Policy guidance on allocation actions is provided in the Magnuson-Stevens Act (National Standards and 303A provisions pertaining to limited access privilege programs), the goals and objectives of the Council's groundfish FMP and those specified for this amendment. Guidance related to goals and objectives has been grouped into categories in the summary shown in Table 1.

[1] For the IFQ program, a management unit is defined by the species or species group, area, and trawl sector (e.g., shoreside, mothership, or catcher-processor) for which QS is issued.

Table 1. Policy guidance on allocation decisions from the MSA and Council goals and objectives.

Guidance	Reference
Conservation: Allocations Reasonably Calculated to Promote Conservation.	MSA - National Standard 4(b)
Net Benefits and Efficiency Consider Efficiency Reduce Capacity Attempt to achieve the greatest net economic benefit to the nation Provide for a[n] . . . efficient groundfish fishery.	 MSA - National Standard 5 MSA - 303A(c)(1)(B) GF FMP Obj 6 A-20 Obj 2
Disruption (Efficiency and Equity Implications). Accomplish change with the least disruption of current domestic fishing practices, marketing procedures, and the environment (NOTE: this objective also has implications for efficiency and net benefits).	GF FMP Obj 15
Excessive Shares (Efficiency and Equity Implications). Control of Excessive Shares(including geographic concentration)	MSA - National Standard 4(c) MSA – 303A(c)(5)(B)(ii) MSA – 303A(c)(5)(D) A-20 Constraint 6
Fairness and Equity Establish procedures to ensure **fair and equitable** initial allocations, including consideration of (i) **current and historical** harvests; (ii) **employment** in the harvesting and processing sectors; (iii) **investments** in, and dependence upon, the fishery; and (iv) the **current and historical participation** of fishing communities;	MSA - National Standard 4(a) GF FMP Obj 13 MSA – 303A(c)(5)(A)
Fishery Participation. Limit IFQ to persons who **substantially participate** in the fishery	MSA – 303A(c)(5)(E)
Market Power. Avoiding provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.	A-20 Constraint 5
Sector Health Provide for a viable, profitable . . . groundfish fishery. Promote measurable economic . . . benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.	 A-20 Obj 2 A-20 Obj 6
Labor: Crew, Proccessing Plant Workers Etc. Include measures to assist, when necessary and appropriate, . . . captains, crew Promote measurable . . . employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.	 MSA – 303A(c)(5)(C) A-20 Obj 6
Communities Consider Importance to Communities (in order to provide sustained participation and to the extent practicable minimize adverse impacts) Consider promotion of sustained participation by fishery dependent communities Include measures to assist, when necessary and appropriate entry level and small fishing communities 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. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.	 MSA - National Standard 8 MSA – 303A(c)(5)(B)(i) MSA – 303A(c)(5)(C) GF FMP Obj 17 A-20 Obj 5
Small Vessels, Small Entities, and New Entrants Consider promotion of sustained participation by small owner operators Include measures to assist, when necessary and appropriate entry level and small vessel owner-operators . . . Avoid unnecessary adverse impacts on small entities.	 MSA – 303A(c)(5)(B)(i) MSA – 303A(c)(5)(C) GF FMP Obj 16
General Public: Auctions – must be considered	MSA – 303A(d)

In the following sections, we will draw on this guidance in focusing our evaluation of various initial allocation provisions.

A-2.1.1 Eligible Groups

A-2.1.1.a Groups and Initial Split of QS

Eligible Groups

- What groups will be eligible to receive an initial allocation of QS (A-2.1.1.a)?
- How much of the initial allocation will go to each group (A-2.1.1.a)?

❖ Provisions and Options

- Included

Eligible Groups The initial allocation of QS will be made either only to permit owners or to permit owners and processors (note: buyers may serve as a proxy for processors (see Section A-2.1.1.b)

	Nonwhiting Sector QS		Whiting Sector QS	
	Amount to Permits	Amount to Processors	Amount to Permits	Amount to Processors
Option 1	100%	0%	100%	0%
Option 2	87.5%	12.5%	75%	25%
Option 3	75%	25%	50%	50%
Option 4 (10% for Adaptive Management)*	100%	0%	100%	0%
Option 5 (10% for Adaptive Management)*	75%	25%	50%	50%

* Annually, 10 percent of the available QP will be set aside for use in an adaptive management program.

The Council may select other distributions within this range.

- Rational and Options Considered but Not Included

The NRC report on IFQ program design (NRC 1999) contained the following recommendations with respect to groups for which an initial allocation of QS might be considered.

NRC Recommendations for Allocation Groups **(Other than Vessel Owners)**	
Skippers and Crew Allocations	Consider where appropriate. Lack of detailed catch data is not a reason to forgo this option as equal allocation is an option. It may be less appropriate in industrial fisheries that do not involve crew members as co-venturers in the same sense as other fisheries.
Processor Allocation	No compelling reason to include or exclude processors from an initial allocation.
Communities	Consider initial allocations of IFQ to communities. Some communities may be heavily dependent on fishing for social, cultural, and economic values and/or are lacking in alternative economic opportunities.
Public	Consider auctions, lotteries or combinations of mechanisms to allocate initial shares. Avoid taking for granted the option of "gifting" IFQ.

With respect to vessel owners, the NRC report notes that they are usually the recipients of initial allocations and makes the following recommendations with respect to allocation to other fishery participants (NRC 1999, pgs. 202-207). Initial allocation to "permit owners" as a group was not considered in the NRC report. Most likely because the permit owner was considered to be analogous to the vessel owner. Permit owners generally tend to be the vessel owner but not always. Since establishment of the groundfish license limitation system, permit owners have been the recipient of new limited entry allocations (the fixed gear sablefish endorsement and fixed gear tier system). Criteria often mentioned in connection with this issue include compensation for those whose asset values are adversely affected by the new program and minimizing disruption (PFMC, 1998). During scoping public comments also recommended consideration of allocations to crew and captains, vessel owners, communities, lottery entrants, and auction. Of these the TIQC recommended that consideration be given to allocation to current owners of LE permits, vessel owners, processors or combinations thereof, or auctions. Of these it included only LE permits and processors in the program alternatives it sent to the Council.

The TIQC recommended against allocation to vessel owners rather than permit owners, because once the limited entry fishery was established most of the value of the fishery was capitalized into the value of the permit. The TIQC recommends not considering allocation to the owner of a vessel or permit at time of landing (i.e., personal history) because no rationale could be identified for allocating to someone who no longer owns the fishing asset used to take the fish. Allocations should go to the current owner of an asset based on the history of the asset (e.g.,,, permit or vessel). Allocation to crew members was opposed because of the data problems entailed and because crew members did not have physical capital, the value of which would be affected by the initial allocation.

SECTION TO BE FILLED OUT WITH DISCUSSION ON ALLOCATION TO COMMUNITIES AND PUBLIC AND A SUMMARY OF RATIONALE FOR AND AGAINST ALLOCATING TO PERMIT HOLDERS AND PROCESSORS.

An option to allocate non-whiting groundfish evenly between permit owners and processors (50 percent each) was rejected. The following is the rationale provided by the TIQC and GAC in its recommendations for removal of this option.

Rationale for removing the 50/50 option for nonwhiting groundfish:

- TIQC members raised concern that with a 50 percent allocation to processors, the quota initially allocated to a trawl permit may not be enough to allow for fishing. One TIQC member opposed to removal of the 50 percent allocation option noted that analysis of impacts has not been completed and so the suggested impacts are only assumed. *(2/2007 TIQC mtg)*
- The majority of GAC members believed that a 50 percent initial allocation to processors would create an imbalance of power. They cited as examples the lack of power that vessel owners have had in negotiating crab prices and the potential for the number of alternative buyers to be more restricted within smaller geographic regions than it is coastwide. GAC members also noted concern that the initial allocation would only be the starting point with respect to the amount of shares controlled by processors and that they would expect processors to acquire additional shares, subject to accumulation limits. Some processor/permit owners may also receive shares for both their processing activity and permits they own. In general, there was a perception that there is a current imbalance in favor of the processors and that a 100 percent allocation to harvesters would not create an imbalance in favor of harvesters. On that basis they recommended that the analyzed range be narrowed by reducing the maximum amount that might be allocated to processors while maintaining the option of a 100 percent allocation to permit holders. A minority of GAC members wanted to see the analysis of a 50/50 split before making a decision. It was noted that analysis has not yet been produced to demonstrate that an imbalance would result from a 50/50 initial allocation, though question arose as to the extent that a quantitative analysis could provide insight on this issue. *(12/2006 GAC mtg)*

- During discussion, concern was also expressed that vessels fishing IFQ provided by processors might not have the same incentive to minimize bycatch as it would for its own IFQ. Others countered that the processor and vessel would both have incentive to minimize bycatch in order to maximize their ability to harvest and process target species. *(12/2006 GAC mtg)*

Initial rationale for including a 50/50 option: Part of the original rationale for the 50/50 option, when the TIQC developed it, was that it was the closest legal alternative to a two-pie system.

❖ Interlinked Elements

The following elements of the IFQ program interact with the decision on groups to which an allocation will be made.

● Grandfather Clause Exemption for Everyone (Section A-2.2.3-e)

There are options:

- To provide a full grandfather clause exemption to those who would receive QS in excess of the accumulation limits as a result of the initial allocation (Grandfather Clause Option 1),
- To provide an exemption for up to twice the vessel accumulation limits (Grandfather Clause Option 2), and
- To provide no exemption (Grandfather Clause Option 3).

Depending on which of these grandfather clause options are implemented, the initial allocation options may result in dramatically different distributions and impacts. These differences are discussed in the analysis.

● Additional Measures for Processors (Sections A-2.4 and A-3)

The key decision for eligible groups and initial split (A-2.1.1.a) is whether or not processors will receive an initial allocation of IFQ and if so how much. The following elements are contingent on initial allocation of QS or QP to processors to address concerns about adverse impacts of IFQ program on processors. While addressing this impact, these options would issue QS that is different in character or for a different duration than the QS issued to LE permit holders (e.g., issued as QP under the adaptive management program).

A-2.4. Additional Measures for Processors. There are options in section A-2.4, all of which are interlinked with the options of Section A-2.2.1. The options are not mutually exclusive.

Option 1 (Limited Duration QS): QS issued to processors based on buying history will expire after a certain period of time (to be determined as part of final Council action). When they expire all remaining QS would be increased proportionally to sum to 100 percent. The rationale for this provision is based on the idea that, if an initial allocation to processors is intended to provide an adjustment period and compensate processors for potential harm, this intent can be fulfilled by issuing QS that has shorter duration than those issued based on harvesting history.

Option 2 (No Grandfather Clause for Processing History): Any QS issued for processing history would not be subject to the accumulation limit grandfather clause (i.e.,, processors would be held to the accumulation limits except with respect to catch history issued for any LE permits held by the processor). The rationale for this provision is that processors need not be grandfathered in above accumulation limits in order to receive sufficient compensation for adverse impacts of the IFQ program.

Option 3 (Adaptive Management): The adaptive management program will be used to compensate processors for demonstrated harm by providing them with QP. This provision provides processors relief one year at a time only after harm has been demonstrated. This option strongly interacts with Eligible Group Options 4 and 5. Under Eligible Group Option 5, only those processors that do not receive an initial allocation (either because they don’t meet recent participation requirements or enter the fishery after 2003) could directly receive QP issued as compensation for harm to processors under the Option 3 criteria.

A-3. Adaptive Management. Under the adaptive management program, 10 percent of the trawl allocation available for the IFQ program would be set aside as QP that would not be issued to eligible groups directly; rather, some other criterion would be used to compensate for such things as unexpected shifts in the geographic distribution of catch or landings. If Eligible Groups Option 4 is selected, that criterion would include compensation for unexpected effects on processors (buyers). If Eligible Groups Option 5 is selected processors receiving an initial allocation would not be eligible to hold QP issued though through the adaptive management program because they would have already received compensation through the initial allocation.

❖ Analysis

The following are the key questions to be covered in this section of the analysis.

1. How does the initial allocation affect who holds the QS over the long-term?
2. How does who holds the QS at any point in time affect program performance?
3. What are the equity and other effects related to who receives the initial financial benefit (wealth) from the initial allocation?

The answer to the first question determines the duration and timing of the effects covered under questions two and three. Impacts of the initial allocation are itemized in the following table. The section on the effect of the QS allocation on the long-term distribution is extensive and covers topics of relative efficiency, vertical integration, market power and access to capital. For that reason a summary is provided at the start of the section to provide an orientation provide a guide to those subsections which may be of greatest interest to the reader.

		Related Category of Goals and Objectives									
Type of Impact that May Vary Based on Initial Allo Impact of QS Allocation on Long Term Distribution cation	Summary (Page Ref)	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Impact of QS Allocation on Long Term Distribution	A-14-21	X	X	X	X	X	X	X	X	X	
Impact on Conservation (Resource Stewardship)	A-70	X									
Impact on Sector Health											
Buyers/Processors	A-73			X			X			X	
Harvester Sector—Permits	A-86			X			X				
Harvester Sector—Vessels	A-89			X			X			X	
Labor—Harvester	A-90							X			
Labor—Processors	A-90							X			
Impact on Net Benefits	A-92		X								X
Impact on Equity	A-100				X	X					

Note: The general public is affected by many if not all of these impacts. For example, reduced net benefits has an effect on the general public, but indirectly though the effect on the economy. Here the emphasis is on the direct effect (e.g., paying for administrative costs related to allocation).

Before discussing how the initial allocation affects distribution over the long term and the impacts resulting from allocation of QS to different groups, it is useful to have a brief discussion about the entities composing those groups.

- ## Who: Nature of the Entities and Group Membership

The following is a general discussion of group membership. Specific criteria for membership in a group are described starting in Section A-2.1.1.b.

As we consider the groups to which allocations are made, we should take into account that some entities may qualify as members of a variety of groups. Therefore, when we talk about vessel owners, some vessel owners may also be processors. The remainder of this subsection describes a variety of activity mixes that entities may engage in as fishery participants in order to optimize their income and control risk. Readers who feel they have a grasp of this concept may want to skip to the later sections describing impacts.

People have many roles as fishery participants.

Permit owner
Vessel owner
Vessel operator
Crew member
Fish buyer
Fish buyer/processor
Fish buyer/processor employee

An individual or business entity may combine a mix of roles to create a business strategy. As summarized below, these strategies vary in profit generation and risk exposure.

Role	Part of Business Strategy
Permit ownership only	Lease permit to vessel and collect rent
Vessel owner	Lease vessel and collect rent
Vessel owner-operator	Warn income from both vessel ownership and by providing labor
Permit owner, vessel owner, vessel operator	Earn income from permit ownership, vessel ownership, and by providing labor. Reduce risk by being present to oversee vessel operations
Fish buyer and permit owner	Earn income by buying-selling fish, from permit ownership, and possibly increase security over supply through permit ownership.
Fish buyer/processor	Earn income from buying-selling and added value from processing
Fish buyer/processor and permit owner	Same as fish buyer/processor with additional revenue and some additional control over access to the resource through permit ownership
Fish buyer/processor, vessel and permit owner	Same as fish buyer/processor with additional revenue and some additional control over access to the resource through vessel and permit ownership
Custom processor	Processor that does not take ownership of the fish. Provide services only reduce marketing risk.

Those who provide labor may also have a variety of strategies. Vessel operators (captains) are often also owners (as mentioned in the above table). Additionally, crew members may have ownership interest in vessels, particularly if a family operation. It is also possible that some crew members also work as plant employees (if it occurs it might be most likely on a plant-owned vessel).

SOME OF THE FOLLOWING MAY BE USEFUL IN CHAPTER 3
Data on total membership in groups (number of permit owners, number of buyers, number of buyer processors, etc.)
Data on combinations of activities and form of ownership:

Data on cross-ownership of permits and processing operations.
Data on owner-operator vessels vs. those not run by an owner-operator.
Data on permit owner/vessel owner situations.
Data on corporations owning vessels.

● Impact of QS Allocation on Long Term QS Distribution

♦ *Summary and Section Overview*

In this section we address the relationship between the initial and long-term distribution of QS among groups. The main dynamic driving the long-term distribution is that more profitable entities are more likely to acquire the QS than less profitable entities. In considering relative profitability both the total financial profits and the level of risk must also be taken into account. Broadly speaking, a firm's financial profitability are affected by the following factors:

- its relative operating efficiency
- its vertical integration (which affects both operating efficiency and market power)
- its ability to exert market power to capture above-normal profits
- its access to capital.

Market power is defined as the ability to influence prices in order to obtain above-normal profits for a sustained period of time, and requires barriers to entry. Within the framework of these considerations Table 2 on page 21 provides this section's main conclusions on

- status quo conditions,
- the influences of the IFQ program on QS distribution (regardless of the initial allocation), and
- initial allocation on factors affecting the long-term distribution of QS.

The reader may wish to review these conclusions before delving into the substantiating discussions.

Decomposition of the exvessel transactions. Often in IFQ fisheries, the reported prices implicitly include the price of the IFQ that the fisherman brings to the transaction. The IFQ program we are considering may include an allocation to processors, in addition to harvesters. Additionally, over time the QS may be redistributed among harvesters and processors and also transferred to, crew, communities and others. Therefore, in order to understand both the short- and long-term effects, we breakdown this discussion of market prices into the payment the harvester receives from processors in association with the raw fish the harvester delivers, and the payment received by the QP holder (which in many cases may also be the harvester, but in some cases not). This also helps us understand how the different groups are affected if harvesters, processors, or QS holders are able to exert market power.

Under IFQs, market power reduces QS value but usually not the price attributable to production of the raw fish. Under fully competitive situations the QS value will reflect the value of resource rents[2] The ability of the harvesting sector or the processing sector to exert market power is an ability to capture the resource rents associated with the QS (Table 4provides an explanation of terms such as "resource rents"). "Capturing" the rents simply means that market power is being used to achieve more favorable prices for the one entity at the expense of the profits of the other, essentially capturing the profits or rents of the other entity. Except in extreme circumstances, once the fishery is rationalized the normal profit return for their business activity should not be affected by the exertion of market power (i.e. a normal profit return for the harvester or processor will not be affected by the exertion of market power by the other side, but the value of the QS would be reduced). Increased efficiency in the harvesting sector will reduce the marginal cost of that sector and therefore reduce the lowest exvessel price at which harvesters are willing to fish. If the harvester owns the QS, they will be able to ask for a higher exvessel price because that price represents both the cost of the raw fish and the resource rents. If they do not own the QS the exvessel price they might expect will reflect their operating costs including a normal profit return. A similar situation would apply to processors. Any efficiency or profit increases for processors that occur as excess capacity leaves the industry or wholesale product value increases will be reflected in an increased willingness to pay for raw product. Under competitive conditions, this will increase resource rent and the amount harvesters of processors pay for QS.

Under IFQs, shifts in market power affect their return on investment for second generation owners. Under status quo management, resource rents are either captured (when one side or the other of the raw fish market is able to exert market power) or dissipated by overcapitalization. Under an IFQ program, the resource rents are captured in the QS value. If both sectors are fully rationalized and the harvester or processor is able to exert market power the payment to the QS holder will decline because there would be little reason for the harvester to fish for less than its marginal cost, nor reason for the processor to pay more than what it can make for the product. Thus the effect of exercise of market power is on the distribution of resource rents between groups, as represented by the value of the QS rather than normal operational profits of either harvesters or processors. Initially, the resource rents subject to capture will be from QS granted as an endowment to the initial recipients. Those entering later in the fishery will have paid for the QS and be relying on the income from the QS for return on their investment. Thus if one group or another establishes more market power after second generation owners come into the fishery, the effect will not only be on the distribution of resource rents among QS holders, harvesters and processors, but also on the distribution of profits and return on investment for the second generation QS owners.

Section Overview. In the sections that follow, we start with some conceptual groundwork: "Raw Fish Markets and Resource Rent Dissipation or Capture Under Status Quo" and "QP Markets and Interaction with Raw Fish Markets". The order of discussion in these sections we will be as follows:

1. Identify general economic principles
2. Identify how those principles play out when the fishing industry is highly competitive (i.e., composed of many entities acting independently)
3. Identify what happens if one sector or the other is not highly competitive and define "market power"

After that we will get into the specific factors affecting QS flow ("QS Flow among Groups (Independent of the Initial Allocation)"). In each subsection we

1. Describe the factors of interest and their conditions under status quo,

[2] Resource rents that are either captured or dissipated under status quo (see QP Markets and Interaction with Raw Fish Markets).

2. Describe how those factors may change under an IFQ program and influence the flow of QS (under fully competitive and less competitive conditions).

Finally we will look at the effect of the initial QS allocation on these factors and how they then in turn affect the long term distribution of QS, assuming fully competitive and less than competitive conditions.

As we go through this discussion it will be important to keep in mind that the market of focus will be the raw fish market, the exchange between harvesters and processors, and the QS/QP market. Any discussion of the wholesale fish market rather will be noted when relevant.

The following are the subsections and main points of each that lead to the conclusions provided in that table.

Section Summary: Raw Fish Markets and Resource Rent Dissipation or Capture Under Status Quo page A-5

In this section we explain:

1. How prices and quantities produced are determined in a typical market
2. How the yield constraint in fisheries (usually an OY or allocation) results in a gap between the minimum harvesters are willing to fish for and the maximum that processors are willing to pay
3. That the gap between these two values are the potential resource rents
4. That both sides will try to use bargaining power to capture a portion of those rents
5. That when both sides of the raw fish market are highly competitive (many entities acting independently) that gap (the potential rents) is dissipated through competition and the potential rents are lost to increased costs
6. That when one or both sides are able to exert market power,[3] they capture at least some of those potential rents

Section Summary: QP Markets and Interaction with Raw Fish Markets page A-25

In this section we explain that:

1. Under an IFQ program, the QP will represent an additional key input
2. Under fully competitive conditions in the harvesting and processing sectors the QP holder will capture the difference between the minimum harvesters are willing to fish for and the maximum that processors are willing to pay, i.e. the resource rents.
3. Under fully competitive conditions the raw fish costs will vary with harvester costs (presumably decreasing under an IFQ program); the transaction prices for delivering fish (exvessel value) will depend on who provides the QP for the transaction.
4. With respect to the owner of QP exerting market power,
    a. It is difficult for an entity that holds QP to increase its profits on a transaction for which it holds the QP[4] (the only opportunity is to attempt discriminatory pricing[5] such as can sometimes be achieved by monopolists).

[3] Note that for item 3 the term "bargaining power" was used rather than market power. Bargaining power is a short term concept. It may enable a firm to establish an above normal price. Marketing power requires that the above normal price be sustainable. Unless there is a barrier to entry, the higher price established through bargaining power will be dissipated has high profits invite competition.

[4] Or the portion of the transaction for which it holds the QP.

[5] Discriminatory prices would involve a harvester charging a processor a higher price based on that processors ability to pay more or a processor paying a harvester less based on that vessels ability to fish at a lower cost.

b. If an entity successfully exerts market power over a transaction for which it does not hold QP,[6] the QP holder for that transaction[4] will experience a loss of profits.
c. If the source of an entity's or sector's market power is the amount of QP it holds, the additional profits that it might collect using that power are limited to those represented by the QP held by the entity it faces across the market (e.g. if harvesters hold all the QP, they collect all of the resource rents and are not in a strong position to extract additional rents from processors, except possibly during the transition period during which the processors are overcapitalized).

Section Summary: QS Flow among Groups (Independent of the Initial Allocation) page A-28

In this section we look at the dynamics affecting the flow of QS among groups independent of the initial distribution. The dynamics to be discussed affect the willingness and ability to pay for QS (the center box of Figure 6.) Topics addressed are:

- relative efficiency;
- vertical integration;
- market power; and
- access to capital.

These topics are represented by the hexagons in Figure 6. Factors to be considered for each of these topics are provided in the related squares and each square is accompanied by a note box indicating the nature of the dynamic or affect.

Relative Efficiency (Intramarginal Rents) page A-31

With respect to relative efficiency and profits per unit of raw product we

1. Explain the concept of relative efficiency within a sector;
2. Note that those firms with greater relative efficiency are more likely to acquire QS over the long term;
3. Note that there may be overcapitalization in both the harvesting and processing sectors, and the possibility that over the short term IFQs provide more direct opportunity for harvesters to increase efficiency, as compared to processors;
4. Note that firms with identical efficiency could have substantially different levels or profit per unit of raw product, and that such differences would likely affect the flow of QS over the long term. These differences may occur within or across sectors.

Vertical Integration, Return on Investment (Quasi Rents), and Above Normal Profits (Economic Rents page A-33

1. Under status quo, most vertical integration occurs through processor ownership of vessels. There has been relatively little harvester ownership of processors in the nonwhiting fleet, though some has recently developed in the at-sea mothership fishery, and catcher-processing vessels are vertically integrated.
2. The IFQ program provides processors a new opportunity to vertically integrate by acquiring QS, but acquisition of QS does not provide harvesters an opportunity to control processing operations. Therefore, vertical integration by harvesters is discussed under the section on market power.

[6] Or the portion of the transaction for which it does not hold the QP.

3. There are a number of reasons to expect processor vertical integration, including supply security, profit protection and capture and expansion of market share by preventing competitors from accessing a key input (for example, raw fish), i.e. foreclosing access.
4. Typically, vertical integration also involves certain management expenses and additional risks. QS provides an opportunity for exerting control over harvesting operations at substantially less management expanse and risk.
5. Vertically integrated firms will have more profits to protect per unit of QS, giving them greater incentive and ability to acquire QS.
6. The opportunity for individual processors to vertically integrate will be limited by accumulation limits. Depending on grandfather clauses provisions, some processors may find themselves in a position of needing to divest themselves of vessels in order to stay within accumulation limits.
7. The opportunity for the sector as a whole to integrate will depend on the total number of active processors.
8. Under IFQs, vertical integration may increase a firm's profits and/or reduce risk, thereby enabling it to further expand its QS holdings.

Market Power, Horizontal Integration, and Consolidation page A-37

As a reminder, at this point we are evaluating effects of the IFQ program on market power **independent of the effects of the initial QS allocation.**

1. If a firm or sector is able to exert market power, it will be more willing and able to pay for QS.
2. An adaptation of a widely used market power model (the Porter 5 Forces Model) is used which provides specific criteria for evaluating the following factors:
    a. Rivalry and coordination within a sector
    b. Relative bargaining power across sectors (between harvesters and processors, including the threat of substitutes)
    c. Barriers to entry

    In each section we first describe the criteria provided by the model, and then evaluate status quo conditions and the changes expected under an IFQ program (independent of the initial allocation). In a subsequent section the results are resummarized and presented as context for an assessment of the effects of the initial allocation on market power (starting on page of A-62 of "Summary of Influences on the Flow of IFQ among Groups and Effect of Initial Allocation of QS")
3. Rivalry and coordination. Ten criteria are used for this evaluation, iincluding concentration of production within the sector and the presence of an active industry shakeout process.
    a. Under status quo, there are many reasons to expect high rivalry for both harvesters and processors. However, license limitation may constrain high rivalry among harvesters. For processors, previous industry shake-outs, the small number of firms handling most of the product, and the threat of the effects of another shakeout may reduce rivalry.
    b. Under IFQs, an shakeout among **harvesters** is expected, followed by a period of reduced rivalry with fewer total participants. The need to acquire QP may stimulate rivalry in the QS/QP market, but higher costs (e.g. observer costs) may stimulate cooperation among harvesters in their negotiations with processors over raw fish prices. For **processors**, the low cost of moving QS/QP across geographic areas and the link between the QS/QP and raw fish markets will increase the geographic extent of the market for raw fish. This will expand the

number of processors that effectively have a role in a particular transaction. Rivalry may increase if processors attempt additional consolidation as a means of defending against the possible exercise of harvester market share. Rivalry will also increase because the expansion by any processor will require the direct and immediate contraction of processing by another processor (as compared to the current lag, which occurs as an expansion by a particular processor works itself out in the management system and marketplace).

4. Bargaining Power. There are seven criteria for evaluating bargaining power (including ability to threaten vertical integration and ability to switch to a different processor or different harvester.
    a. Under status quo, nearly all of the criteria favor processors.
    b. Under IFQs, **harvesters'** bargaining power may increase. Harvesters may have more opportunity to vertically integrate or encourage new entry by acquiring QS or pooling QS and using it to support their own processing facility or encourage a new entrant. Consolidation will leave fewer harvesters for processors to deal with. **Processor** bargaining power may increase or decrease. Processors will be more able to vertically integrate than under status quo, but for larger processors this will be limited by accumulation limits. Some larger firms may have to reduce existing levels of vertical integration (depending on accumulation limit rules). Liquidity of QP will expand the geographic area from which buyers with an interest in a potential QP/raw-fish sale may be drawn. This will increase the number of potential participants in the transaction and reduce bargaining power, but may also increase pressure for further consolidation. This within sector, consolidation may be hampered by QS accumulation limits or occur in spite of them.
5. Barriers to entry. Five criteria used to evaluate barriers to entry, including government regulation and economies of scale.
    a. Under status quo, license limitation provides the barrier for harvesters and economies of scale may create a barrier processors.
    Under IFQs, the entry barrier for harvesters will be greater because of greater fixed costs related to compliance with program regulations, and the need to acquire QS to reach efficient scales of production. There may also be an increase in the entry barriers for processors. The increase in compliance costs for processors is likely to be relatively small compared to harvesters. If some processors experience higher profitability through the acquisition of QS, then subsequent entrants will have a higher entry cost to attain the same level of profitability.

Access to Capital (Demand) - Discount Rates page A-53

1. The price of QS represents the present value of a stream of current profits.
2. Individuals who place a relatively high value on current income (as compared to future income) have what is called "high time preferences" and will be willing to pay less for QS than those with "low time preferences."
    a. There are indications that fishermen may have high time preferences relative to others.
    b. Those with low incomes also have high time preferences. Crew members may fall into this category.

Access to Capital (Demand) – Planning Horizon and Investment Recovery page A-55

The length of time over which one anticipates receiving a benefit will also affect how much one is willing to pay. However, the opportunity to sell the QS and fish-elated business at the end of a personal planning horizon diminishes the importance of the planning horizon, with certain exceptions. For example, the QS owner who has special skills enabling him/her to generate levels of profit that subsequent owners are unlikely to anticipate.

Access to Capital (Supply) page A-56

1. In determining risk lender' considerations include size of the firm, its diversification, assets that may be used as security, and the value of those assets outside the industry in which the firm participates. The cost of loans is lower for entities with lower risk profiles.
2. Harvesting firms tend to be smaller than processing firms, and less of the capital may be useful in other sectors, making it more expensive for harvesters to access capital (on average).
3. The IFQ program will decrease the risk profile for harvesters that remain after consolidation.
4. If it is anticipated that harvesters will be able to exert market power, there may be a perceived increase in risk to processor profits. There also may be a transition period during which processor profits are reduced, prior to the exit of excess capital from the industry.
5. Harvesters and processors that acquire QS are likely to reduce risk and the cost of their access to capital, as compared to firms that do not have QS.
6. A harvesters without QS will be viewed as a substantially greater risk than a processor without QS.

Summary of Influences on the Flow of IFQ among Groups and Effect of Initial Allocation Page A-59

The following table summarizes our conclusions on the conditions for the harvesting and processing sectors with respect to each of the four major influences on willingness and ability to pay for QS. It describes conditions under status quo, what the expected influence of the IFQ program will be, and the effect of increasing the allocation to processors. The sections summarized above and provided in detail in the body of this section supply the supporting information for these the conclusions.

Table 2. Summary of influences of the IFQ program and the initial allocation on the flow of QS with a focus on the harvesting and processing sectors.

	Status Quo	IFQ Program (page)	Initial Allocation
Relative Efficiency: If there is an efficiency differential between the sectors, IFQ will flow to the more efficient sector (pages A-33 and A-59).			
	One sector may have greater relative efficiency than the other.	• If there is an efficiency differential between the sectors, IFQ will flow to the more efficient sector • Over the short term, there are more reasons to expect the harvester sector efficiency will be enhanced than the nonwhiting processing sector. • If so, this may or may not alter whether and if so which group is more efficient (depends on whether there is a differential, the starting point and degree of change).	The capital infusion represented by the initial allocation will provide an opportunity for harvesters and processors that receive an initial allocation to increase their efficiency. This will increase the initial recipients ability to accumulate QS.
Vertical Integration: Firms integrate vertically for market security, asset protection, rent capture, and market foreclosure. IFQs will increase vertical integration incentive (pages A-33 and A-61).			
	Processors tend to be more vertically integrated than harvesters.	• Harvester's vertical integration will not be constrained by accumulation limits. • As harvesters become more profitable, they could become more of a target for vertical integration by smaller processors (rent capture). • QS provides processors a less expensive way to vertically integrate and a new way to foreclose market opportunities of competitors. • However, processor vertical integration will be constrained by accumulation limits.	• Initial allocations will enhance the recipient's resources for vertical integration. • For processors, a larger allocation to processors will lock in a greater vertical integration advantage for established larger processors *vis a vis* other processors (assuming a grandfather clause); however, accumulation limits will prevent them from increasing their vertical integration. As grandfather clauses expire (or if there is not a grandfather clause), more QS will flow into the market and strongly vertically integrated processors will weaken.
Market Power: QS will likely flow toward those with more market power because of their higher profits (pages A-37 and A-62)			
	Incentives for processor and harvester rivalry may each be constrained. There are more indicators that processors are likely to be able to exert bargaining power than there are for harvesters (this is not a statement as to whether or not either sector has in fact exerted market power) Indicators of potential bargaining power favor processors and indicators of entry barriers may favor harvesters. Barriers are necessary for long term-preservation of market power.	For harvesters • Rivalry is expected to decrease after an initial shakeout, • Bargaining power increase through consolidation and opportunity to vertically integrate, and • Entry barrier increase For processors • Rivalry is expected to increase, • Possible bargaining power decrease because QP liquidity increases the distance from which potential buyers may be drawn, reduced opportunity for vertical and a decrease in the relative advantages of horizontal integration. • The result for entry barriers is more uncertain.	***As amount allocated to processors increases*** For harvesters, • Increased rivalry in QP and raw fish market including increased strategic stakes. • Latent permits may become active to handle processor QP • Fewer assets to support vertical integration threat in price negotiations For processors • Effect on rivalry depends partly on the grandfather clause (grandfather clause will decrease rivalry relative to no grandfather clause) • Reduced exit barrier would tend to decrease rivalry • Increase assets to support vertical and horizontal integration (may be more an advantage for smaller firms, depending on relative efficiencies) • Processor-held QP can be used to activate latent permits, increasing processor bargaining power • A greater entry barrier (including a temporary scale advantage by larger processors) will help protect any negotiating advantages that are established.
Access to Capital: QS will flow to those with greater demand for and cheaper access to capital. (pages A-53 and A-68)			
	Harvesters may be willing to pay less for capital because of high time preference. Processors may have access to cheaper capital because of lower investment risks.	• Industry stability is expected to increase (particularly for harvesters), potentially decreasing the cost of capital. • QS of tenuous value as an asset for securing a loan. • Firms with cheap access to capital are more likely to acquire QS & grow. • The risk of lending may increase, if the IFQ program increases harvester opportunity to exert market power.	• Initial recipients will receive an infusion of wealth which may give them cheaper access to capital (lower interest rates). • Harvesters not receiving enough QS to support their business plan will have a less secure income flow and if financially distressed; may have a hard time securing loans for QS/QP acquisition or other capital investments. • For processors, QS/QP is not needed for operation but an initial allocation will increase the security of their access to raw product, reducing risk and therefore lowering capital costs.

We will lay the groundwork for this discussion by examining how resource rents are dissipated when the raw fish market is competitive and when the sectors are not competitive. We will then consider how IFQs act to extract the resource rents and the linkages between the IFQ and raw fish markets. Following this we will look at the expected flow of IFQ among groups regardless of the initial allocation. Finally, we will look at how different distributions of the initial allocation may alter the flow and long-term distribution. This then sets the stage for the sections that consider the impacts, which vary depending on who is given the QS and whether those impacts are considered short term or long term.

Some parts of the discussion will be simplified by focusing primarily on IFQ held as QP. QP are issued annually to those holding QS. Where it is necessary to consider the long-term stream of harvest opportunity we will focus on IFQ held as QS.

♦ *Raw Fish Markets and Resource Rent Dissipation or Capture Under Status Quo*

The price of QP will interact with the reported market price for fish. In order to understand these interactions and how breakdowns in the assumptions about perfect competition affect the expected outcome for QP it is useful to first address status quo raw fish markets and the dissipation of resource rents.

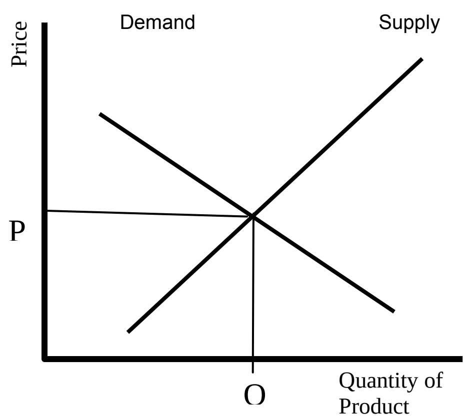

Figure 1. Market price (P) and quantity (Q) at equilibrium (quantity supplied matches quantity demanded.

In a competitive market situation, the quantity of an item produced or demanded (the horizontal axis in Figure 1) is related to its price (the vertical axis in Figure 1). This is true for consumer goods and for factors of production (the inputs that businesses need to support production and manufacturing). In input markets, the price a firm is willing to pay for an additional unit of an input (for example, raw fish) is related to the additional revenue that the firm will be able to generate as a result. The amount of an input supplied is determined by its marginal cost, the cost of supplying each additional unit of the input (the supply curve in Figure 1). In general, as in the market for consumer goods, as price increases, purchasers buy less (the demand curve) but suppliers are willing to supply more. Conceptually, when the amounts supplied and demanded are identical an equilibrium price is reached (price “P” and quantity “Q” in Figure 1). In practice, a stable equilibrium is seldom reached. However, this conceptual construct is still useful for as an entry point for understanding the dynamics and interactions of the raw fish and QP markets under fully competitive conditions and conditions that are less than fully competitive.

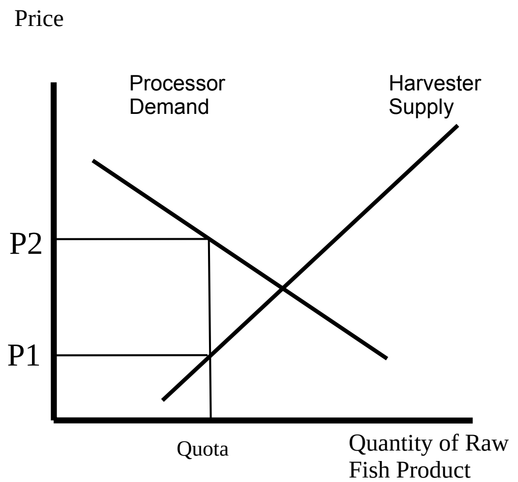

Figure 2. Harvester cost (P1) and raw fish market price (P2) when harvest is constrained by a quota and rents are not dissipated through harvester capital investment.

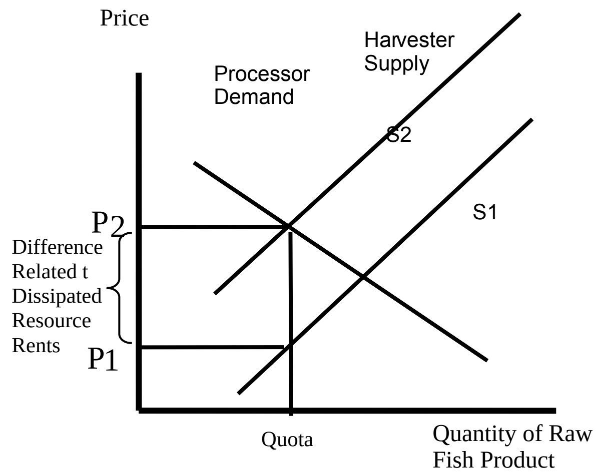

Figure 3. In this example it is assumed harvesting and processing sectors are fully competitive, and that harvester costs increase from S1 to S2, dissipating potential resource rents (see text for discussion of processor competition on the position o the processor demand curve and the resulting price).

Fisheries managers impose constraints to protect a resource (“Quota” in Figure 2). In Figure 2, the quota could be produced at a cost of P1 and processors would be willing to pay price of P2. The difference between P1 and P2 reflects the rents that could be charged for the resource. However, these rents are not extracted. Processors and harvesters will struggle during price negotiations to exert bargaining power and capture a portion of the potential rents. However, to the degree that they are successful in capturing some of the difference between P1 and P2, their above normal profits will cause them to compete more among themselves and attract in additional entrants, expanding capacity. Under fully competitive conditions, new entry and increasing competition raises costs and dissipates rents, as illustrated by the shift from supply curve S1 to S2 in Figure 3. The resulting price in this example is P2. The competition for harvest may also require processors to increase their invesment in capital to levels above that necessary to process the fish. For example, if the fishery becomes season limited (e.g., becomes an Olympic fishery like the current shoreside and mothership sector whiting fisheries) processors with insufficient capacity to handle the product available during the season would invest in additional capacity to allow them to process in a time frame that matches the vessels’ harvesting time frame. The use of additional capital and variable inputs to increase their production capacity increases their costs and may reduce the price they are willing and able to pay for the product. In Figure 3 this would be reflected by a downward shift of the processor demand curve. If both the supply curve shifts up and the demand curve down, the result would be that for fully competitve harvesting and processing sectors the lines would intercept above “quota” (on the x-axis) at some point between P1 and P2 and all resource rents would be fully dissipated. In the shoreside nonwhiting fishery, cumulative trip limits have been implemented specifically to constrain the pace of the fishery. Therefore, there is not currently a race for fish and the need for processors to invest in additional capacity is limited. Nevertheless, there may be some overcapitalzation in the fishery due to the dramatic declines in optimum yields for certain speices since the late 1990s. While there is not a race for fish in this fishery harvest sector, over-capitalization in this fishery has occurred through investments occuring prior to the cumulative limit management regime imposed in the early 1990s, declining OYs, continuation of Olympic fishing conditions in other fisheries in which trawl vessels also participate, and government programs encouraging invesment in domestic fishing capacity.

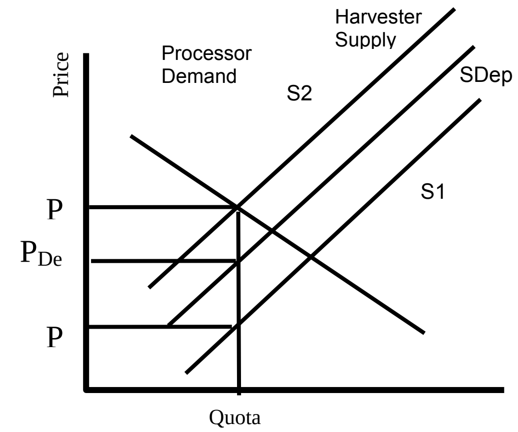

Figure 4. Capture of a portion of the available rents (difference between P2 and PDep) through the example of a possible buyer (processor) exercise of market power.

In the case that either sector has more market power, resource rents might not be fully dissipated. Market power means that members of at least one of the sectors can influence price to move away from the competitive equilibrium and use that power to capture a portion of the resource rent. Factors that make it likely that a sector will be able to exert market power are discussed in more detail in the section on QS flow among groups (page A-28). For harvesters, the effective exercise of market power to capture rents would also require some additional self restraint or constraints such as barriers to entry.[7] Otherwise, we would expect harvesters to use the resource rents they capture as profits to support their competition for harvest, thereby raising their cost curve and, over time, dissipating the rents.

Suppose a quota constraint creates an opportunity to capture rents and the rents are not dissipated. If processors are able to exercise market power and capture all the rents, the price for raw fish would be P1 (Figure 4). If processors are able to use market power to capture only a portion of the rent, they might be able move the raw fish price to an intermediate position. For example at an intermediate equilibrium, denoted P_{Dep}, processors would capture the difference between P2 and $P_{Dep.}$ If vessels are able to exert market power they would capture the difference between P1 and $P_{Dep.}$ Unless the coordination that allowed them to exert the market power also enabled them to constrain their competition with one another, the difference between P1 and P_{Dep} would be dissipated as the industry supply curve shifts to S_{Dep} in Figure 4. Along the same lines, returning to Figure 3, if the harvesters are able to capture all of the available rent and not dissipate it with increased capital investment (the supply line remains at S1), the price for raw fish would be P2 and the rents captured would be an amount associated with the difference between P2 and P1. If they dissipate all of the rent in the race for fish, the harvester supply line would rise to S2.

[7] The license limitation program provides some constraint on expansion of harvesting capacity and possibly supports increased co-operation among harvesters in that regard. However, there are still some permits that are unused or relatively unused. Also, for the whiting fishery, where the race for fish continues, there continues to be an opportunity for capital stuffing (i.e. increasing the amount of capacity used with a permits within the constraints of that permit).

♦ *QP Markets and Interaction with Raw Fish Markets*

With an IFQ program in place, there are two key inputs for production, raw fish and the QP necessary to extract that quantity of raw fish. Both of these inputs need to be brought together to complete a legal landing. If the harvesting and processing sectors are competitive (a large numbers of sellers and buyers acting independently), the price of QP is expected to be the difference between P1 and P2 in Figure 2. Vessels will only be willing to fish if they receive at least P1 for their deliveries of fish (their marginal costs). In a competitive market there will be a processor willing to pay P2. If markets are functioning effectively, the person holding the QP should be able to find a vessel willing to harvest for P1 and a processor willing to pay P2, and thereby capture the difference. The QP holder could be the permit owner, vessel owner, crew, processors, communities, or others. Regardless of whom they are, in a competitive situation the QP holders would be expected to capture the resource rent.[8] The actual market prices observed for raw fish will be affected by who holds the QP and the terms and conditions on which the QP is acquired. The following example of raw fish price outcomes assumes that both the harvesting and processing sectors are competitive.

- If a vessel holds its own QP, the price for the fish would likely be reported as P2 and include within it the value of the QP supplied for the transaction (in Figure 2). P2 is composed of the vessel marginal cost (the minimum the vessel would fish for, P1 in Figure 2) plus the price of the QP supplied by the vessel (the difference between P2 and P1).[9]
- If a processor holds the QP and is buying from an independent vessel, the transaction price would vary depending on the arrangements by which the QP are transferred to the vessel account (i.e. whether the QP price was wrapped together with the fish price). For example, if a processor provides the QP at "no charge" then the exvessel price would be expected to be the vessel marginal cost (P1 in Figure 2). If a processor sells the QP to the vessel, the price of the QP would be recovered in the exvessel price, which we would expect to be P2 if both sectors are fully competitive (Figure 2).

Under a fully competitive situation, if both parties hold some of the QP that will be used in a particular landing actual prices may be between the two extremes (P1 and P2). However, the amount of resource rent collected by each side will be the same as if the two parties had entered into separate sales agreements (i.e., both parties are expected to enter into the agreement only if they can earn as much revenue as they would working with a party who brought no QP to the transaction). Table 3 contains **hypothetical** information used to illustrate the negotiating dynamic when both sides are competitive. In this table expected ex-vessel prices are shown based on the amounts of QS held by vessels and processors assuming:

1. Processor marginal revenue $0.40 per pound
2. Vessel marginal cost $0.30 per pound

- In Scenario 1 all the QP is held by the vessel and the price would be the processor marginal revenue ($0.40/lb) (i.e. the price would include the vessels marginal cost and the value of the QP, P2 in Figure 2).
- In Scenario 2 all the QP is held by the processor and the price would be the vessel marginal cost ($0.30/lb) (P1 in Figure 2).

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[8] If the fishery is overcapitalized, the QP holder may not only capture a portion of the resource rent, but also a portion of the profits expected to other wise accrue to harvesting, and possibly processing, capital. This issue will be addressed in the section on impacts and the equity of the initial QS allocation.

[9] The difference between P2 and P1 represents the vessels opportunity cost for the QP (a profit it could have made by not going fishing and selling the QP to someone else).

- In Scenario 3 the total transaction and the QP held are the sum of scenarios 1+2. The exvessel price will be an amount that brings both the processor and the vessel an amount of rent at least equal to what they would have earned if they entered into separate transactions with other partners, otherwise they would not enter into the transaction. There is only one price that satisfies this condition, $0.366/lb.

Table 3. Hypothetical example of price negotiations between harvesters and processors where both sectors are fully competitive.

	QP Owned by							Rents for QP Collected by	
	Vessel	Processor	Total Landing	Exvessel Price	Exvessel Value	Vessel Marginal Cost ($.30/lb)	Proces-sor Marginal Rev ($.40/lb)	Vessel	Proces-sor
Scenario 1	2,000 lbs	0	2,000 lbs	0.40	$800	$600	$800	$200	$0
Scenario 2	0	1,000 lbs	1,000 lbs	0.30	$300	$300	$400	$0	$100
Scenario 3	2,000 lbs	1,000 lbs	3,000 lbs	0.366	$1,100	$900	$1,200	$200 ($.066/lb)	$100 ($.033/lb)

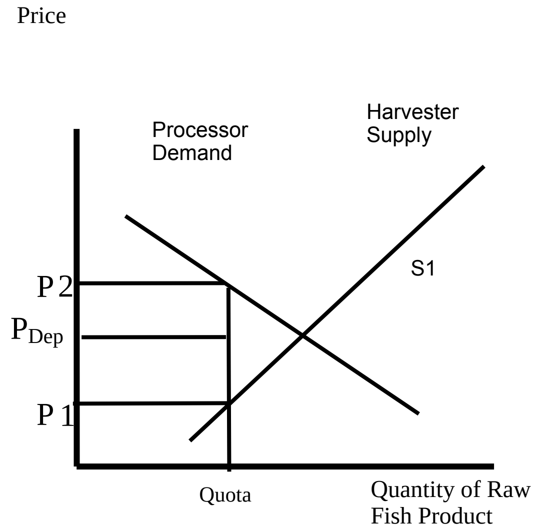

Figure 5. Capture of a portion of the available rents (difference between P2 and PDep) through the exercise of market power by a buyer (processor). QP holders capture difference between PDep.and P1.

If the raw fish market is not fully there are two situations to consider. First consider the situation of the entity who comes to the table with QP and desires to use his/her market power to increase profits. For this example assume that entity is a harvester and he/she is facing a fully competitive processing sector.[10] That entity can do no better than the price P2 in Figure 5, unless it is able to achieve price decimation (i.e. to charge firms for whom the delivery is more valuable more than other firms). Price discrimination is difficult to achieve and usually only arises in certain monopoly type situations. Unless price discrimination can be achieved the harvester can do no better with respect to a delivery for which it has QP. At price P2 the entity receives its full marginal cost of harvesting (P1) plus the value of the QP (difference between P2 and P1. Similar logic shows the same result for a processor bring QP to the table. This then implies that in an IFQ program where at least one side is fully competitive, the only way to exert market power is through the influence of the prices of transactions for which an entity does not hold the QP. For example, if a processor withoug QP and was able to get a harvester to settle for a price of P_{Dep}, in Figure 5, that processor would capture the QP related value reflected by the difference between P2 and P_{Dep}, the harvester would get P1 and the QP holder (who may also be the harvester) would get the difference between P_{Dep} and P1. Of course, if the QP holder is not the harvester, the QP holder may decide to not take part in the transaction and seek an alternative buyer. Similarly, if a harvester <u>without</u> QP faced a processor and were able to get the processor to pay a price of P_{Dep}, the harvester would earn his/her normal return of P1 plus additional profits reflected by the difference between P_{Dep} and P1, the processor would receive the price of P2 and the QP holder (who may also be the processor) would get the difference between P_{Dep} and P1. In both these situations the entity exerting the market power is not the

[10] For now we will also assume the processing sector is fully rationalized so there is not excess capacity.

QP holder and the QP holder loses value (if market power were exerted by the entity holding the QP he/she would only be expropriating rents from his/her self).

Finally consider a possible case where both parties are in a position to exert market power (perhaps one sector is highly concentrated and the other has many entities but is organized and working together cooperatively. Any exertion of market power by one side will come out of the value of the QP held by the other side. To the degree that the source of one sides power is the market shares that it holds, its ability to extract additional profits is diminished by the limited amount of QP held by those on the other side. If the QP holder is a third party (neither the harvester nor the processor) the transaction becomes a three way transaction. In this situation, the QP holders own ability to preserve his/her return on his/her QP holdings will depend on his/her ability to exert his/her own market power.

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♦ *QS Flow among Groups (Independent of the Initial Allocation)*

After the initial allocation, QS will be traded between members of the groups initially receiving the QS and any other entity eligible to own a U.S. documented fishing vessels (whether or not they actually own one). Traditional economic thinking holds that in the absence of transaction costs (the cost of buying and selling something) the QS will end up in the hands of those able to derive the greatest benefit from it and pay for that benefit independent of the initial allocation (Coase 1960) However, transaction costs do exist and more recently it has been demonstrated that other factors are at work such that the initial allocation may affect the long term distribution of a resource (Hurwicz 1995). In this section we seek to put the question of initial allocation in the context of the expected flow of QS among groups no matter who receives the initial allocation. Once we cover the dynamics affecting this flow we will be in a position to look at how the initial allocation might alter those dynamics.

In our previous discussion we have focused on QP. Our focus now turns to QS. The distribution of QS determines who receives the QP in each year it is issued. The value of the QS is directly related to the value of the QP that will be issued for those QS in the future. We will consider the following factors from the perspective of their influence on the flow of QS among groups, independent of the initial allocation (also see Figure 6).

1. Relative efficiency and intramarginal rents (page A-31)
2. Vertical integration, quasi rents, and economic rents (page A-33)
3. Market power, horizontal integration and market share consolidation (page A-37)
4. Access to capital (demand) (page A-53)
    a. Time preference
    b. Risk
    c. Planning horizon
5. Access to capital (supply) – risk (page A-56)

Above we have identified that under an IFQ program, resource rents in the form of profits will be captured by the owner of the QS, regardless of the nature of that entity (vessel, processor, crew, etc.). In the following discussion it will be important to consider other sources of profit and how they vary within and between sectors. This includes discussion of normal profits and intramarginal rent (see relative efficiency), as well as quasi rents and economic rents (see vertical and horizontal integration). This table provides a brief overview of these economic concepts and the technical terms we use for them.

Table 4. Explanation of Terminology: return on investment, profits and rents.

General Term and Description of the Concept	Economic Term
Return on Investment: The level of profit required to compensate for capital investment (compensate the owners of capital). For industries that involve greater risk, greater return is required to compensate or attract capital investment. If the industry profit level is not enough to pay compensate capital, there will not be new investment.	Quasi Rents
Efficiency Profits: Profits earned by firms that are more efficient than others.	Intramarginal Rents
"Reasonable" Profit Level: Income necessary to pay for all labor, supplies, capital, and entrepreneurial expertise used by a firm at going market prices. This includes compensation for capital (quasi rents).	Normal Profits (Zero Economic Rent or Zero Economic Profit)
Extra Profits (Abnormal Profits): Any earnings above normal profits are considered "economic profits" or "economic rents." Economic profits or rents attract new entrants.	Economic Rents (Above Normal Profits)
Cost of the Resource: Amount paid for the use of a raw resource. In open access fisheries management, no one collects resource rents; therefore resource rents show up as economic rents, which attract new entrants until efficiency decreases to the point that only normal or less than normal profits are earned.	Resource Rents

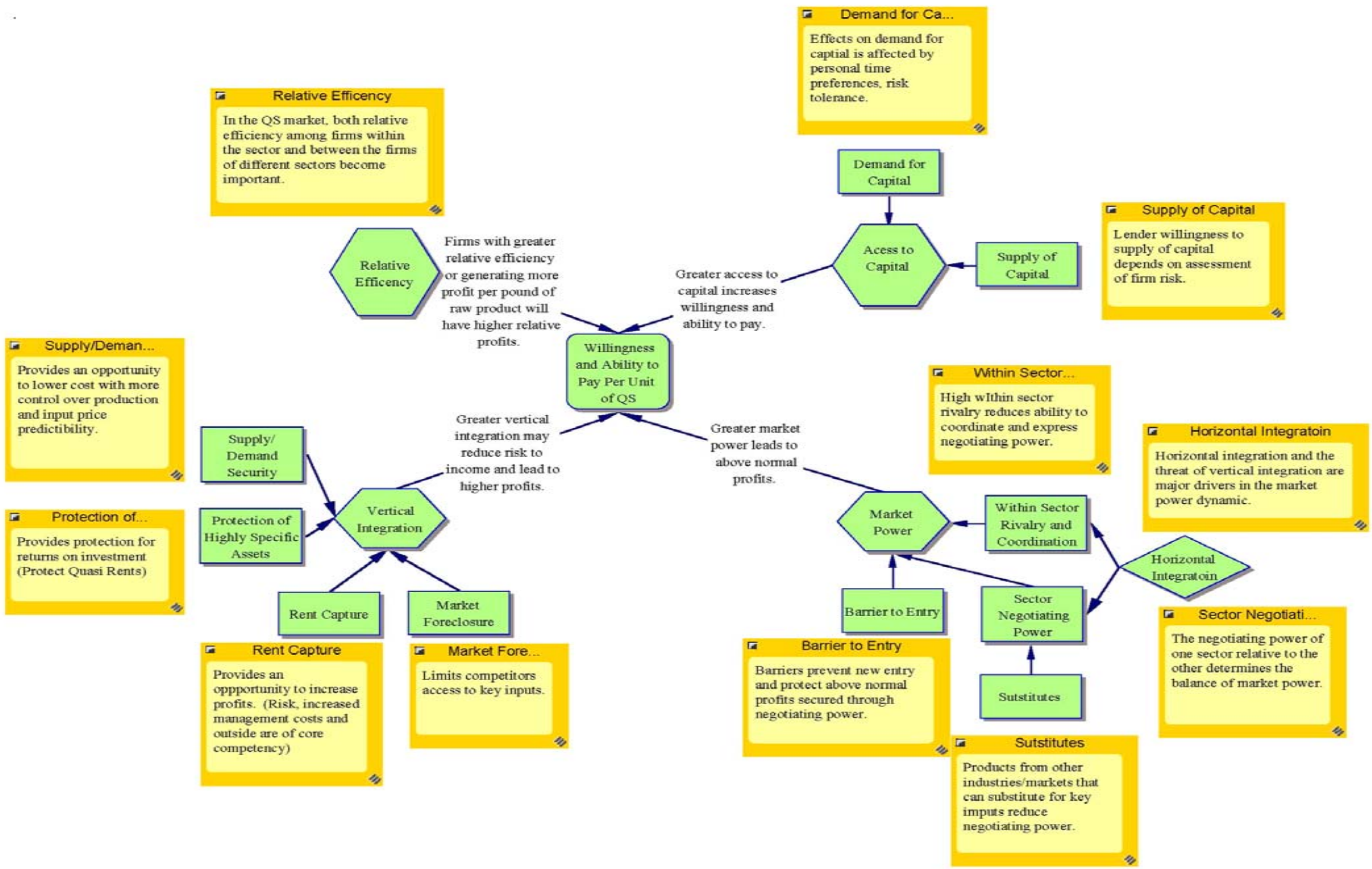

Figure 6. Factors influencing QS flow among groups.

RELATIVE EFFICIENCY (INTRAMARGINAL RENTS) AND PROFIT PER UNIT OF PHYSICAL INPUT

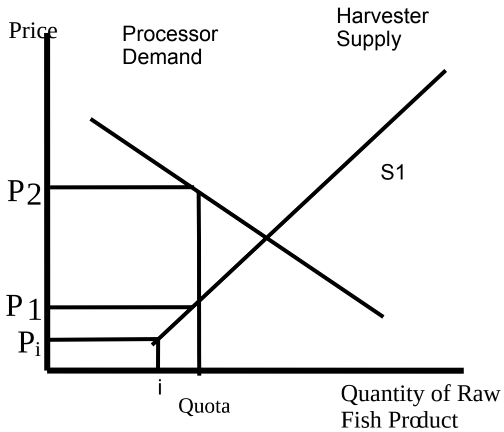

Figure 7. Sector supply and demand curves and a point that represents a firm capturing intramarginal rents (difference between P1 and Pi).

If the harvesting and processing sectors are competitive and the market and sectors achieve a long-run equilibrium, we would expect all participants in both sectors to be equally efficient and for both processors and harvesters "economic" profits would be zero (all entities would have "normal" profit levels). However, in reality even if an equilibrium market price is reached it is likely that some firms will be more efficient than others.[11] Additionally, it is possible for the business models of two firms can be equally efficient but produce different levels of total revenue per unit of input of a key raw produce. Those firms that are more relatively efficient and those firms that produce more value per unit of a key input (raw fish) are more likely to accumulate QS over the long run.

Firms that are more efficient than others in a sector earn extra profits, sometimes identified as intramargianl rents.
In Figure 7 these firms are represented by points on the X-axis that are to the left of "Quota" (for example "i"). Such a firm has lower cost and would be willing to produce at a price of Pi. The difference between P1 and Pi is an indicator of the intramarginal rent for that firm.[12]

Implementation of the QS program itself may affect both the harvester supply and processor demand curves. The harvester supply curve should go down as vessel efficiency improves, scale of operations increase and less efficient capital leaves the fishery. If processors are overcapitalized or involved in the race for fish the height of the processor demand curve may also increase as the amount of capital and other costs decline. The IFQ program may have a differential effect on the profits of one sector as compared to that of another. The IFQ program appears to provide more direct opportunity for the harvesting sector to improve operational efficiency as compared to processors (Table 5). This effect is mainly due to the fact that a harvester without QP will be forced to leave the fishery while there is no mechanism which directly forces some processors to leave their sector.

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11 The long-term equilibrium in which all firms are equally efficient is rarely, if ever, reached

12 This explanation is a simplification to illustrate the main point. For a complete and technically accurate explanation of intramarginal rents and their relation to resource rents. see Coglan and Pascoe (Coglan and Pascoe 1999).

Table 5. Conditions leading to overcapitalization and opportunities for efficiency improvements for harvesters and processors in the nonwhiting and whiting sectors.

	Nonwhiting		Whiting	
	Status Quo	**IFQS**	**Status Quo**	**IFQs**
Harvesters	The race for fish occurred primarily in the 1980s and early 1990s. Imposition of 2-month cumulative limits and license limitation strongly muted capitalization. Overcapitalized state compounded by harvest contraction. Operational inefficiencies from constraints of 2-month cumulative limit management.	The IFQ program directly provides an opportunity for increased efficiency through consolidation of QS, transfer of operations to more efficient producers, flexibility in determining harvest strategies (timing and species mixes), regulatory stability and more direct control over planning.	Overcapitalized in race for fish. Operational inefficiencies from race for fish.	Same as for the non-whiting fishery with the addition of the opportunity to improve efficiency through more control over the pace of fishing and improved product quality with better handling.
Processors	Overcapitalized through harvest contraction. Operational inefficiencies from constraints of 2-month cumulative limit management.	Processors will have less certainty about the expected flow of product except to the degree they can influence product flow through the prices they offer or by acquiring QS. Over time, excess capital will diminish but the IFQ does not provide a direct mechanism for consolidation of processing opportunity (processors without QS can continue to compete for deliveries by vessels with QS).	Overcapitalized in race for fish. Operational inefficiencies from race for fish.	Processors will be gain efficiency with the slower pace of harvest and may be able to increase the value of their product with better handling or the development of higher value product forms. Over time, excess capital will diminish but the IFQ does not provide a direct mechanism for consolidation of processing opportunity (processors without QS can continue to compete for deliveries by vessels with QS).

See Sections 4.x.x and 4.x.x. for discussions of the efficiency effects of the IFQ program on the trawl and processing sectors, respectively. Note that the existence of differences in relative efficiency within a sector depends on the industry not reaching a complete equilibrium and is independent of whether or not a sector has been able to exert market power and influence price away from the market equilibrium.

Relative efficiency is generally determined on a financial basis. One of the factors determining the flow of QS will be the amount of profits a firm is able to generate with that QS on the basis of per unit of raw product. Profit per unit of raw product and overall efficiency may vary from one another. First we look at this in a different industry. **The point of this discussion is not to identify a particular direction that QS is likely to move but rather that there is a dynamic and therefore an uncertainty related to the differences between financial efficiency and relative profitability per unit of a key raw product that could operate to drive the distribution of QS in one direction or another independent of differences in factors such as market power.** Consider farming and the production of wheat. Assume that both the grain growing and grocery industries are competitive, both with normal returns on investment, and that wheat is the key input without which there would not be a loaf of bread to sell. We know that there are only a few cents worth of wheat in a loaf of bread that may cost several dollars. And we know that on a per unit basis the farmers profit is a fraction of those few cents while the grocers profit is some fraction of the dollar (a larger amount). Thus in a competitive market, the profit both earn on a financial basis may be similar but the amount of profit per unit of the raw product may be substantially different. If each are now offered the opportunity to insure their profit based on a rate per unit of grain, the grocer will be willing to pay more because he has a greater dollar profit at risk. From this viewpoint, it is possible to demonstrate the potential for two companies operating at different points in the production change with equal relative efficiency on a dollar basis to generate different levels of profit on the basis of units of raw fish. The following table contains **hypothetical numbers** and is provided **only for the purpose of demonstrating the feasibility of this outcome** and therefore the potential for QS to flow toward one sector or another even though both are competitive and generating similar returns on investment. In this hypothetical example, the numbers indicate the processor would be willing to pay more. **The numbers could be constructed differently to indicate the processor would be willing to pay less.** There can be similar differences within an industry where a company that is marketing a more specialized product is able to generate similar profitability and returns on investment but with a different level of input of the raw product.

Table 6 Hypothetical **demonstration of** theoretical potential **for two equally efficient firms to generate substantially different profits per unit of raw product.**

	MT (Raw Product)	Price Received Per Pound	Gross Rev	Annual Variable Costs**	Annual Net Revenue	Capital Investment	Real Capital Depre-ciation Rate	Annual Return on Total Capital Invest ment	Annual Expenditure **	Net Revenue Per Dollar of Annual Expendit ure	Dollars of Net Revenue Secured Per MT of QP
Vessel	4,000	0.05	440,924	330,693	110,231	1,000,000	0.07	0.11	397,360	0.28	28
Processor	20,000	0.34	14,991,416	10,493,991	4,497,425	40,000,000	0.14	0.11	16,208,277	0.28	225

** Annual expenditure includes variable costs and a capital depreciation expense related to real depreciation (as opposed to depreciation for tax purposes)
* For the processor the amount in this hypothetical includes the amount paid for the raw product.

The case of equally efficient firms with different business models and different amounts of profit per unit of raw product could apply within a sector as well, consider a firm producing for specialty markets as compared to a firm producing for a commodity market. Such firms may use different levels of raw inputs to achieve comparable financial efficiencies and returns.

A number of other factors that affect efficiency will be influenced by the creation of an IFQ program. Some of these are discussed below in sections on integration and access to capital.

VERTICAL INTEGRATION, RETURN ON INVESTMENT (QUASI RENTS), AND ABOVE NORMAL PROFITS (ECONOMIC RENTS)

Vertical integration or control occurs when a firm owns or exerts control over its suppliers or buyers.[13] Businesses may vertically integrate to increase technical efficiency,[14] increase economic efficiency by

[13] Vertical Integration or Vertical Control: Ownership or control of (1) suppliers (backward integration, e.g., a buyer owning a vessel)), (2) buyers (forward integration, e.g., a vessel owning a buyer). Some companies engage in both forward and backward integration (balanced integration). Horizontal integration is the term used for one firm owning another that is producing the same outputs (e.g., one harvesting company owning another harvesting company).

[14] An example of technical efficiency is the integration of the steel production process such that material that is already hot does not have to be reheated for the next phase of the production process. At this point, technical efficiencies have not been identified with respect to the harvester processor interface.

internalizing transaction costs, and/or seek to exert market power (Perry 1989). A processor that also owns a harvesting operation is a vertically integrated company. In commercial fisheries some factors that may encourage vertical integration are

- supply/demand market security
  - price
  - quantity
  - quality
  - timing
- protection of profits from assets that are highly not easily employed in some other use ("highly specific" or "nonmalleable" assets)
- the capture of profits from another level of the production chain (rent capture)
- preventing competitors from acquiring a key input – for increasing market share (market foreclosure)

(adapted from Dawson 2003)

Increased management costs and expansion beyond areas of core competence may be a downside of vertical integration.

QS ownership does not provide harvesters a direct opportunity to vertically integrate in that QS are required for harvesting and provide no opportunity to direct or control processing operations. Therefore, discussion of the opportunities that an IFQ program may create for harvesters to vertically integrate is taken up in the context of the IFQ program's affect on market power (see in the following section, "Market Power, Horizontal Integration, and Consolidation").

There are a number of reasons to expect that processor vertical integration might increase under IFQs:

- The opportunity to own QS may provide a less expensive way for processors to respond to existing pressures for vertical integration (ensuring market security or protecting assets that may not be easily transferred to other uses, nonmalleable assets).
- If market power exists in the harvesting sector or an increase in harvester market power leads to above normal profits (see following section, page A-37), the opportunity to capture these profits (rent capture) would create additional incentive for vertical integration through direct ownership of a harvesting company. Acquisition of additional QS would be expected to accompany this integration.
- The exclusivity of QS provides a new opportunity for processors to increase their market share by acquiring QS and thereby foreclosing the opportunity of competing processors.[15]

Processors that are vertically integrated through ownership of vessels will have more incentive to acquire QS to protect their profits than firms that are not vertically integrated. For these entities, the acquisition of QS will protect both the profits from their harvesting operations and processing operations.

While there reasons to expect that processors may acquire QS in response to changing incentives and opportunity for vertical integration brought on by the IFQ program, accumulation limits may substantially limit a given processor's ability to vertically integrate and for some processors could even reduce existing levels of vertical integration (immediately, if there is no grandfather clause, or over time as the grandfather clauses expire). Accumulation limits would prevent processors from using QS to support as

[15] This opportunity to expand vertical integration through QS and thereby horizontal will be greater for small buyers than for larger buyers. The effect of this incentive on the program over the very long run will depend on the number of viable buyers that eventually end up being active in the fishery. If the consolidation of buyers decreases and we end up with as many as 20 significant buyers, with a 3% control cap and sufficient vertical integration incentive buyers could control 60% of the total QS.

great a proportion of their production as harvesters, because on a per operation basis processors handle larger volumes than harvesters. Vertical integration through direct ownership of vessels would also be constrained by accumulation limits. If a processor is at its control accumulation limit any additional harvesting vessel it acquires could only utilize those QP coming from the QS already under the processor's control. Table 42, Table 44, and Table 47 show the number an amount by which processors are expected to be in excess of control limits, depending on the amount of QS allocated to processor (these tables include the amounts allocated to processors based on any permits they own). The processor would not be able to acquire additional QP for those vessels since any such acquisition would put the processor over its accumulation limit. Therefore accumulation limits will limit some processors' ability to acquire both QS/QP and additional vessels. For smaller processors, and for the sector as a whole, opportunity for vertical integration still exists. If in the future the number of significant processors in the fishery increases (the current level of consolidation decreases) the potential for the processing sector as a whole to control QS will increase.

Vertical integration entails a firm taking on management costs related to merging the newly acquired means of production. If a firm is already vertically integrated and is just expanding the amount of that integration there may be little additional risk. However, if the firm is extending beyond its area of core competency for the first time it would be taking risks which could lead to higher production costs until full competency is developed. Managing a skilled crew and operation of a fishing vessel requires knowledge substantially different from the operation of a processing facility.

The implementation of an IFQ program will provide processors of raw fish some opportunity to extend their control over supply production without necessarily needing to incur the management costs associated with control over a fishing vessel. By holding QS a processor will be able to offer QP to the available fleet and have more leverage to control the timing of the delivery of those QP. However, while holding the QP provides the processor with an additional degree of vertical control, it is not enough to entirely free the processor from uncertainty about the price it will have to pay to get the raw fish delivered in the fashion it desires. The vessel will still be an independent operation. For example, even if the processor holds the QP, if the vessel also has its own QP or there are competing processors in the area, it may still need to offer a higher price for the raw fish to get the desired delivery terms (time and quantity). Ownership of the underlying QS would secure QP price certainty for the processor and substantial leverage but not complete certainty with respect to the raw fish price.

Supply/Demand Market Security

In general, price, quantity, quality, and timing are market security issues that can be addressed through vertical integration. With respect to quantity in a delivery, quality, and timing, processors can influence the delivery of an independent harvester through price negotiations or general market offerings. However, doing so involves transaction costs, which can be avoided with vertical integration. Vertical integration allows the producer to plan and control production and, most importantly, to know price (Arrow 1975). For example, with respect to timing and quantity, the producer can more efficiently allocate labor and assets that are fixed for the time period. It is also easier for a processor to control production quality when the employees work for the processor rather than the harvester. In situations where investment to support production for an upcoming period must be made with only partial or uncertain information about market price for key inputs in the upcoming periods, there will be a tendency for firms to vertically integrate. Moreover, in such a situation this tendency for vertical integration will also encourage horizontal integration and the exertion of market power (Arrow 1975). Under an IFQ program, the opportunity to own QS would provide processors a lower cost means for vertically integrating for market security.

Asset Specificity (Malleability) and Quasi Rents

Highly specific (unmaleable) assets are those that cannot be easily transferred to other uses if access to a key input is lost. The value of the asset that is not recoverable through transfer to another use is considered a sunk cost or sunk portion of the asset. Consideration of asset specificity needs to take into account not only the alternative use of the asset but also the cost of moving the asset into the alternative use. They represent the return on investment that is necessary to attract and maintain capital in an industry. The difference between the value of the asset in its current use and its value in the next best use is the *quasi-rent*.[16] Quasi rents are considered a part of "normal rents" or "normal profits."
Where the number of suppliers is limited, profits needed to pay a return on capital investment (quasi rents) may be subject to capture. For example, if one of a very limited number of suppliers is selling an input, knows that a customer has equipment must have that input (that there are few substitute inputs) and that the customer's equipment is not easily transferred to a different use, that supplier may be able to negotiate a higher price and capture some of the buyer's profit otherwise needed for a return on investment. Alternatively, a customer who is buying from a supplier with a very unmalleable asset might be able to capture some of the suppliers return on capital investment. Such a circumstance might arise if there are a limited number of customers and a product that is highly specific in its use and the time of its availability. An example would be a vessel with a hold full of fish and no pre-agreed upon buyer. In this case the fish are the unmalleable asset. Thus specific assets earn a return that is subject to capture when there are market imperfections. The capture of these profits can only be sustained over the short term, otherwise the firm losing the profit will not earn enough to replace its capital and will be forced to eventually leave the industry.

In the section above on the interaction of QS and raw fish markets (page A-22), we noted that when the raw fish market is fully competitive the QP owner would be expected to capture resource rents. With fully competitive markets and overcapitalization, the QP owner may capture both the resource rents and some of the quasi rents. In an overcapitalized situation, firms seeking to ensure they have sufficient product for optimal production levels will bid away some of the profits (quasi rents) that would other wise go to returns to capital. However, this would be a short term phenomena. As assets age and deteriorate and are not replaced—all else being equal—QP prices would be expected to decline. The decline in QP prices would yield back the profits for return on investment in order to induce new investment. This dynamic is discussed in more detail in the section on impacts (see page A-75 of "Investment, Dependence, and Disruption" in the section on impacts on "Buyers/Processors").

Rent Capture and Economic Profit (Economic Rent)

Vertical integration is also a way for one sector to capture another sector's economic profit (an economic rent). Economic rent is any profit that is earned above that necessary to pay all costs including the cost of recouping the original capital investments. Economic rents are termed "above normal" profits.[17] Vertical integration may be through forward integration (a harvester buying a processor) or backward integration (processor buying a harvester). But a firm would need to consider increased management costs and the risk associated with expansion of the business beyond its area of core competence.

[16] The term "economic profits" or "economic rents" occur when profits are above normal. See the following section for additional discussion of economic rent.

[17] Economic rent does not include quasi rent since quasi rents are necessary to maintain an asset in the industry over the long run (i.e., to provide incentive for future investment). The intramarginal rents earned by firms that are more efficient than others may be economic rents (discussed in the section on relative efficiency, page A-31). Also, above normal profits earned by firms exerting market power would be considered economic rent.

When both sides of a market are competitive and at equilibrium there would be no above-normal rents to capture through vertical integration. However, if one or both sides are exerting market power under status quo, or become able to exert power as an outcome of the IFQ system, then rent capture may act as an increased incentive for vertical integration (see the following section on market foreclosure and the section discussing horizontal integration, starting on page A-37). Firms able to capture economic rent will place more value on QS and have more incentive to buy QS to secure access to their key input.

Market Foreclosure

Firms may vertically integrate to limit their competitor's supply. While vertical integration occurs under status quo, use of that integration to foreclose a competitors market is difficult. Any additional harvesting capacity acquired by a processor competes with existing harvesting operations, effectively reducing the 2-month cumulative limits (or the season length, in the case of catcher vessels participating in the whiting fishery). It might be argued that the license limitation program makes it difficult to add capacity. However, there are latent permits and permits that are not used to full capacity. Even if a processor acquires a fully utilized permit and vessel, the competitor losing deliveries from that permit and vessel has access could potentially bring on line one of the latent or underutilized operations. Since QP would become a key production input for which there is no substitute, the creation of an IFQ system would provide a new opportunity for entities to foreclose a competitor's access to another key input (raw fish) and expand market share through vertical integration by the purchase of QS. Alternatively, if prevented from acquisition of QS through accumulation limits, a processor might secure a contract for delivery by a vessel with QS. Since no one else could purchase the fish associated with the QS assigned to that vessel, this would be a form of vertical control and market foreclosure. However, use of such contracts by processors could be counted toward a processor's QS/QP accumulation limit. Whether accumulation control limits would apply to marketing commitments secured by this type of a contract would need to be determined.[18] Foreclosing a competitor's access to an essential input (raw fish) will become more feasible under an IFQ program. On that basis existing incentives may get played out through acquisition of additional QS. This in turn could lead to further consolidation in the processing sector, as discussed in the following section on market power.

Market Power, Horizontal Integration, and Consolidation

"Market power is viewed as the ability to maintain ***long-term abnormal profit…***" (Poole and Van de Ven 2004). Market power enables firms to move price away from the competitive market-determined equilibrium. In a fully competitive market, no firm or sector has market power because none can influence price away from the equilibrium. If a firm is able to achieve above normal profits through the expression of market power, they will (1) be *willing* to place a higher value on the QS because the QS represents a larger stream of profit to them than to other firms, (2) be *able* to pay a higher price for the QS because they earn greater profits. Thus if a firm or sector has market power under status quo and it is maintained under the IFQ program, or the firm or sector establishes market power under the IFQ program, QS will flow in the direction of the entities with market power.

Market power is influenced by:

- Rivalry and coordination within a sector (page A-38). Effective exertion of market power requires coordinated action and coordinated action is affected by the degree of rivalry within a sector.

[18] While under a control limit fishery managers would not directly monitor these contracts, if suspicion arises that an entity is exceeding a control cap via the use of private contracts, that circumstance could be investigated and at that time contracts would be evaluated as a potential violations of the control cap.

- Relative bargaining (negotiating) power between sectors (page A-41). The bargaining power of the sector vis-a-vis another sector is affected by current conditions and threats of longer term recourse. This topic will be addressed in three parts:
  - Threat of substitutes
  - Harvester bargaining power
  - Buyer/processor bargaining power
- Barriers to entry (page A-42). Higher profit will attract new entry which will then disrupt market power unless it can be maintained with barriers to entry.
  (adapted based on (Porter 1980))

One of the major themes that show up in the consideration of rivalry, coordination, and bargaining power is sector concentration (number of firms and whether market share is relatively evenly spread among the firms or spread among just a few). As concentration in a sector increases ability to exert market power increases. Two processes affect concentration:

- Horizontal integration – occurs when one firm acquires another or when firms merge.
- Market consolidation – occurs when existing firms expand market share (with other firms losing market share and potentially exiting the business).

In the following sections we will address each of the factors influencing market power and then turn to the question of how implementation of an IFQ program may change these factors and thereby change the dynamics that influence market power. These sections help to set the stage for addressing the question of how the initial allocation of QS affects the longer-term distribution of QS.

Rivalry and Coordination

Market power requires some form of coordinated action within the sector to move the price away from the market equilibrium (away from the price that results when there are many independent participants on both sides of the market transaction). In some situations there may be legal issues if that coordination is jointly planned. On the other hand, sometimes a single firm acts as a price setter with other members of the sector following that firm's lead. Such coordination through smaller firms following the lead of larger firms is occasionally seen in the airline industry and some other industries with a structure similar to that of west coast groundfish processors (for additional discussion see Appendix C). Coordination also may occur among many entities, as was attempted with mixed success during the mid-coast groundfish trawl vessel tie-up during price negotiations in March-April 2007 (see Section 4.x.x.x). Ability to coordinate within a sector depends on rivalry. High rivalry also increases the threat that difficult negotiations with a particular processor could result in the loss of a raw fish buying customer to a competing harvester. A number of factors affect degree of rivalry. These factors are described in the following text box (Porter 1980).

Within-sector Rivalry (Porter 1980) (this summary adapted from http://www.quickmba.com/strategy/porter.shtml)
The intensity of rivalry is influenced by the following industry characteristics:

1. **A larger number of firms** increases rivalry because more firms must compete for the same customers and resources. The rivalry intensifies if the firms have similar market share, leading to a struggle for market leadership.
2. **Slow market growth** increases rivalry as firms fight for market share in order to continue growing. A firm's growth does not rely on market share competition in a growing market.
3. **High fixed costs** result in an economy of scale effect that increases rivalry. When total costs are mostly fixed costs, the firm must produce and sell at near capacity to attain the lowest unit costs. Rivalry intensifies as firms fight for customers for their production.
4. **High storage costs or highly perishable products** cause a producer to sell goods as soon as possible. If other producers are attempting to unload inventory at the same time, competition for customers increases rivalry.
5. **Low switching costs** increases rivalry. When a customer can freely switch from one product to another there is a greater struggle to capture and retain customers.
6. **Low levels of product differentiation** are associated with higher levels of rivalry. Brand identification, on the other hand, differentiates production and tends to constrain rivalry.

7. **Strategic stakes are high** when a firm is losing market position or has potential for great losses or gains. This intensifies rivalry.
8. **High exit barriers** exist when there is a high cost for abandoning production. This intensifies the rivalry to remain in the sector. High exit barriers cause a firm to remain in an industry, even when the venture is not profitable. A common exit barrier is asset specificity. When the plant and equipment required for manufacturing a product are highly specialized, they are difficult to liquidated when demand within the sector is weak and the assets cannot easily be used in other industries.
9. **A diversity of rivals** with different cultures, histories, and philosophies make an industry unstable. There is greater possibility for mavericks and for misjudging rival's moves. Rivalry is volatile and can be intense.
10. **Industry shakeout** periods intensifies rivalry. When an industry becomes crowded with competitors, and there are insufficient key inputs or insufficient product demand to support all participants a shakeout ensues, with intense competition, price wars, and company failures.

The factors affecting rivalry are listed below with a qualitative evaluation for the harvesting and processing sectors. This evaluation indicates that conditions for high rivalry would be expected in both sectors. High rivalry leads to shake out, which can lead to concentration of the type that is seen in the processing sector (greater concentration reduces rivalry because of the interdependence it creates among the firms as they deal with suppliers and customers).

Factor Causing Greater Rivalry	Harvesters	Processors
1. A larger number of firms with similar market shares	+ More harvesters than processors. + Entities with similar market shares. *Note: Potential sector participants include latent permit holders.*	- Fewer processors than harvesters, Small number of firms. Very restricted in some localities. - Market shares highly concentrated, going mainly to a few companies.
2. Slow market growth	+ Yes	+ Yes
3. High fixed costs relative to variable costs	? Possibly	+ Yes
4. High storage costs or highly perishable products	+ Yes	+ Yes
5. Low cost for customers to switch suppliers	+ Yes	+ Yes
6. Low levels of product differentiation	+ Yes	N/A
7. Strategic stakes are high	+ Moderate for nonwhiting, high for whiting	+ Yes
8. High exit barriers	+ Yes	+ Yes
9. A diversity of rivals	o Uncertain	o Uncertain
10. Industry shakeout.	- Constrained by current management system	o Uncertain. Shakeout may have already occurred.
Summary	Many reasons to expect high rivalry. However, license limitation constrains threat of new entrants; and for nonwhiting, 2-month limits minimize opportunity to compete for market share	Many reasons to expect high rivalry. However, high concentration indicates shakeout may have already occurred; and threat of intense competition may discourage strong moves to expand market shares.

Harvester Rivalry. In the shoreside nonwhiting sector, the number of harvesters is small but large relative to processors (insert number of active harvesters and processors). There is not as much of a difference between the larger harvesters and the smaller harvesters as compared to processors (DATA). Fixed costs for harvesters are probably high relative to variable costs, leading to a strong incentive to maximize the use of capital (survey or other data to substantiate?). However, for the nonwhiting fishery the 2-month cumulative limits prevent this from serving as an incentive for rivalry. Strategically, license limitation and trip limit management provide limited opportunity for direct market share competition or much industry shakeout in the nonwhiting harvester sector. Assuming that within recent price ranges the market is capable of fully absorbing the harvest (i.e., there are not market limits), within a 2-month period no vessel can preempt the harvest opportunity of another. However, there may be a strategic stake in relations with a processor if the market is limited (e.g., a limited ability to absorb Dover sole) and if processors use limited markets as leverage by making the delivery of other products (e.g., crab) dependent on negotiations over groundfish deliveries. Competition is more intense in the whiting derby. Specialized capital with a limited market creates an exit barrier (high cost of leaving the fishery). Total capital invested in a harvesting operation is likely to be lower for harvesters than processors. However, the relative exit cost per dollar of capital (i.e., non-recoverable investment) could be higher than for processors, depending on the alternative activities available for the vessel and other assets of the fishing firm. Lack of unified action among harvesters during the 2007 mid-coast trawler tie-up, which occurred during the price negotiations with processors, indicates that rivalry may be strong enough to prevent coordinated action. The tie-up lasted for 43 days (70% of the bimonthly period), but 44 vessels were active during the tie up and 35 vessels were active only after the tie-up. About 55% of the landings were made during the last 18 days off the tie-up (Table 7). Participation varied geographically (Table 8).

Table 7. Landings and deliveries for vessels during and after the mid-coast vessel price negotiation tie-up (3/1/07-4/12/07)

Period	MT		Exvessel Value		Days		MT/Day	Vessels
3/1/2007 – 4/12/2007	1,194	45%	1,428,863	46%	43	70%	28	44
4/13/2007 – 4/30/2007	1,474	55%	1,699,901	54%	18	30%	82	79
Total	2,668		3,128,764		61		44	94

Table 8. Number of vessels delivering and not delivering during the tie-up by port area.

Port area	Did Not Deliver During Tie-up (3/1/2007-4/12/2007)	Delivered During Tie-up (4/13/2007-4/30/2007)
Northern Puget Sound	4	2
Coastal Washington	1	2
Columbia River	17	5
Newport	7	6
Coos Bay	6	8
Brookings	3	4
Crescent City	5	1
Eureka	5	7
Fort Bragg	2	2
Bodega Bay		1
San Francisco	1	9
Monterey		2

Processor Rivalry. The processing sector appears to also have many characteristics that would lead one to expect intense rivalry within that sector. However, one characteristic in particular indicates that rivalry would *not* be expected: a few processors handle a large share of the raw fish market. It may be that previous shakeouts in the industry have reduced rivalry. If there was strong processor cohesion during the 2007 trawler tie-up, this would indicate lower rivalry in the raw product market (DATA ON PRICES?). If rivalry tends to be low, price setting for raw product may still be competitive or it may be that prices are set as smaller firms follow the prices set by larger firms. While processors do not publish information on offering prices for raw product, the fishing community within a port tends to be small and it is likely that information on offering prices is readily available by word of mouth. Additionally, the processing sector is structured such in a manner such that it is unlikely that firms can set prices independently, even if they wanted to. For example, if one of the larger processors were to increase the price it offers for fish in order to expand its market share, other processors may also increase their prices in order to preserve their shares. If this happens, the firm that started the price increase will not have gained anything production have higher costs and lower profits. Similarly, if that processor were to cut its price, it would have to guess about what it expects its competitors would do. If it believes its competitors will not also cut the prices they offer for raw fish, then by dropping its price it will increase profits to some degree but lose total production. On the other hand, if other processors also drop their price then all processors may gain. This situation in which a firm is not a monopoly but is also cannot change its own price without the possibility of affecting the market prices is typically characterized as an "Oligopsony." In situation like this rivalry may be lower because the major firm must take into account the others firms responses of others to any price changes. In a fully competitive situation, other firms do not usually respond directly to one firm's price changes.

Bargaining or Negotiating Power

In the previous section we focused on the within-sector coordination required to establish market power. Here we discuss factors affecting bargaining power between sectors. These include:

- Threat of substitutes
- Supplier (harvester) power
- Buyer (processor) power

Substitutes. The threat of substitutes refers to substitutes from outside the industry. An often-used example, is the substitutability of glass, metal, and plastic containers. When there is a substitute available from outside the sector, the negotiating stance of the suppliers is weakened. In the raw fish market on the west coast, substitutes appear relatively limited. Processors that are vertically integrated into the wholesale chain may be able to substitute production from other geographic areas to meet customer needs, and may utilize some portion of their processing capacity if they have access to "imported" raw product. However, there are not a lot of substitutes for the profit centers represented by coastal processing facilities. It is likely that locally available resources are fully exploited and that without trawl-caught groundfish supply facilities would be idle more of the time. Processors also face the possibility that if they raise the prices of their products their customers will find substitute fish products from other geographic areas or in the form other protein products. While vessels may move into other fisheries, if they do so in fisheries on the west coast they will likely need to continue to deal with the same processors, particularly if they stay within a restricted geographic range. If they are negotiating with a processor that is a major buyer for several West coast fisheries substitutes that would allow them to credibly threaten to sever relations with a local processor may be limited. This situation could also pertain if a situation existed in which a processor faced a harvesting company that is dominant in a number of fisheries.

Table 9. Indicators of harvester bargaining power.

Indicators of Higher Supplier Bargaining power (Based on Porter)	Evaluation
Suppliers can credibly threaten forward integration (ability to buy or control processing facilities)	No (Yes, At-sea whiting)
Suppliers are reasonably safe from threat of backward integration (a processor purchasing a vessel)	No
Production is concentrated among a few suppliers	No
There is a significant cost for processors to switch to a different supplier	No
The processor's customers are powerful and willing to boycott in support of the suppliers	No
Suppliers products are highly differentiated from one another	No
Sales are spread among many processors.	No

Supplier (Harvester) and Buyer (Processor) Power. Several of the factors related to rivalry within the sector have corollaries in the consideration of supplier and buyer power. The focus here is on relative power between the sectors. One of the indicators of power is the ability of each group to take on the functions of the other (forward and backward integration). Some processors have successfully integrated harvesting operations but, while there have been attempts, there are not many examples of harvesters successfully developing processing operations at a significant level. When activity in one sector is aggregated, that sector will be more powerful, and its relative power is greater if the sector on the other side of the market is disaggregated. Buying power is higher when suppliers are selling products that are not highly differentiate d from those of other suppliers and when the cost to a processor of switching from one supplier firm to another is low. This statement characterizes the situation of harvesters versus. processors in the west coast groundfish fishery. Table 9 provides indicators of supplier power. For each indicator of supplier power, an inverse statement describes buyer power.[19]

The 2007 mid-coast trawler tie-up may provide another indicator of sector bargaining power. Some vessels, both processor-owned and others, did not participate in the tie-up. The tie-up ended when vessels returned to fishing to avoid losing the catch opportunity represented by an entire 2-month cumulative limit period. It was anecdotally reported that there was some disruption in the local wholesale markets, with other products filling in for West coast groundfish; and that when supply returned, those markets had to be regained and the alternative supply displaced.

Barriers to Entry

If a sector is able establish above-normal profits by overcoming rivalry, coordinating action, and exerting power in negotiations, then maintenance of that profit over the long term requires barriers to entry. Barriers to entry can be classified as follows.

1. Government created
2. Patents and proprietary knowledge
3. Asset specificity (capital malleability)
4. Economies of scale

Government Created. Government action may affect barriers to entry by directly restricting participation or indirectly imposing regulations that increase capital or operating costs. The primary direct barrier for the West coast trawl fishery is the limited entry permit requirement. This permit limits the number of harvesting vessels in the fishery and, with Amendment 15 to the groundfish FMP, restricts the movement of vessels between the shoreside nonwhiting, shoreside whiting, mothership whiting, and catcher processor sectors. A buyback program in 2003 dramatically reduced the number of trawl permits, but even with that reduction some permits remain relatively inactive and presumably available for purchase or lease by someone who might want to bring a new vessel into the fishery. Both harvesters and processors operate in a highly regulated environment and face compliance costs.

Patents and Proprietary Knowledge. Control of technology and proprietary knowledge provides competitive advantage where it is not readily available to others. Knowledge of fishing grounds is an example of specialized proprietary knowledge that fishermen often seek to protect. We have not determined whether or not some processing firms have unique knowledge that would create a barrier for new entrants.

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Indicators of Higher Buyer Power	Evaluation
Buyers are safe from a credible threat of forward integration buy suppliers (harvesters are unlikely to acquire processing facilities)	Yes (no for at-sea)
Buyers can credibly threaten backward integration	Yes
Supply is spread among many suppliers.	Yes
There is not a significant cost to switch suppliers	Yes
Buyers purchase a significant portion of the suppliers output	Yes
The product is standardized	Yes
There are a few buyers with significant market share	Yes

Asset Specificity (Capital Malleability). Both harvesters and processors utilize some highly specific assets (vessels and processing facilities, respectively). Alternative uses for a vessel generally involve switching to a different fishery. If the firm retains ownership of the vessel, switching fisheries may mean geographic relocation and the need to acquire new expertise about fishing grounds, fish behavior, and gear operation. When the alternative fisheries are under a license limitation program, permits must be purchased from other vessels. If the vessel only needs a part-time opportunity but the prices for permits in a particular fishery are driven by their value when used full time, the permit cost may be a barrier that prevents the vessel from to switching to the alternative fishery.[20] Table X.X in Chapter 3 indicates the degree to which trawl vessels participate in multiple fisheries. Processors also have some assets that may be specific to certain species (e.g., skinning machines) and other assets that may be more versatile (e.g., cold storage facilities), which may be used for a variety of fish species within the region, and for agricultural and nonagricultural products. Some processors may receive product from other geographic areas and processors that have vertically integrated into the wholesale sector may meet their customers' needs with products from other sources.

Economies of Scale. Critical here is "minimum efficient scale." The barrier will be greater if achieving the minimum size required for cost-efficient production requires a large investment in capital, personnel, and development of organizational structure. Under circumstances where there is a very high initial cost, it may be more likely that a competitor will enter from another geographic area, related industry, or through vertical integration as opposed to building from the ground up. Another vehicle for initial entry would be to use a different business model, for example, on relying on a higher degree of product differentiation, i.e., a company might start up by selling into a small specialty niche market and then increase scale, expanding into less differentiated fish products. Shoreside processing businesses tend to involve larger commitments of capital than harvesting operations, indicating a greater challenge for new entrants.

Table 10. Summary of barriers to entry.

Barriers to Entry	Harvesters	Processors
Government Regulation	Limited number of permits but some "latent". Heavily regulated.	Fishery management related regulations less heavy than for harvesters but also face environmental regulations (waste discharge).
Special Proprietary Knowledge	Fishing locations.	None identified.
Asset Specificity (Malleability)	Very specific (geographic relocation possible)	Very specific Shoreside--not mobile some utility in other sectors. At-sea--mobile
Economies of Scale (fixed costs of attaining efficient production)	Smaller than for processors	Larger than for harvesters

IFQ Program Effects on Market Power and QS Flow

The following three tables and subsequent text describe how implementation of an IFQ Program may influence factors related to market power. The tables review the same indicators of rivalry, market power, and barriers to entry covered in the previous section, evaluating how these indicators would change with the implementation of an IFQ program. The greater the resulting market power, the more likely firms in a business sector (i.e., harvesting sector or processing sector) will be willing and able to pay more for QS, thereby influencing the flow of QS in their direction. Horizontal integration vertical integration and consolidation have a primary influence on market power, and barriers to entry are

[20] On the other hand, if the alternative fishery is under an IFQ program, the costs of the harvest rights necessary to switch into that fishery will likely be more proportional to the vessel's needs.

necessary to maintain that power. The text following the tables provides some additional explanation of the results provided in the tables. In the section starting on page A-59 we will see how these results are influenced by the initial allocation of QS.

Table 11. Effects of IFQ program on the degree of competition and co-operation within a sector (within sector rivalry) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change)

Factor Causing Greater Rivalry	Harvesters	Processors
1. A larger number of firms with similar market shares	- A decrease in the number of active harvesting vessels and harvesting companies (subject to accumulation limits). Much of the rivalry for market share will be focused on the QS/QP market. However, for harvesters who do not own their own QS this competition may also involve rivalry in the raw fish market. - Limited opportunity for latent capacity in the sector to become more active, except through • QP provided by processors or others • direct voluntary reductions by active vessels through QS/QP transfers	+ Decreased geographic isolation of markets, increasing number of participants. + Some pressure for consolidation in response to existing overcapitalization and threat of harvester market power. - However, if there are effective accumulation limits growth of market share for larger firms will have to occur without the advantage offered by QS ownership.
2. Slow market growth	o	o
3. High fixed costs	+ Increased fixed costs (e.g. camera systems), but for harvesters the increase influences rivalry in the QS/QP market more than the raw fish market (though if a harvester is negotiating to access QP held by a processor, the two markets could be linked). - Incentive to exert market power in the raw fish market to increase profits and recover fixed costs.	o Minor increase relative to vessels*.
4. High storage costs or highly perishable products	o	o
5. Low cost for customers to switch suppliers	o	o
6. Low levels of product differentiation	o	N/A
7. Strategic stakes are high	o	+ Increased strategic stakes, expansion requires direct displacement of competitors, more limited vertical integration opportunities.
8. High exit barriers	o	o
9. A diversity of rivals	o	o
10. Industry Shakeout.	± Expected (more stable over the long term)	± Possible (not certain)
Summary	After an initial shakeout, rivalry will decrease with fewer harvesters and accumulation limits constraints. The need to cover fixed costs (including cameras and observers) may stimulate rivalry in the QP market and cooperation in the raw fish market. Rivalry in the raw fish market will occur to the degree that processors offer harvesters their QP, linked with raw fish exvessel price negotiations.	Rivalry will increase as a decrease in the geographic isolation of raw fish markets expands the number of effective participants, processors position themselves to defend against the possible exercise of harvester market power, competition for market share requires direct displacement of other processors, and accumulation limits constrain existing and potential vertical and horizontal integration.

*The IFQ program is likely to increase some processor fixed costs related to compliance with regulations but those costs are not expected to be nearly as substantial as for vessels. To the degree that fixed costs increase, there will be an incentive for processors to increase production, thereby increasing rivalry and posing a higher barrier to new entrants.

Table 12. Table. Effects of IFQ program on the bargaining power of one business sector in relation to the other (bargaining power) ("-" = indicator or less power, "+" = indicator of more power, "o" = no change)

Indicators of Sector Power	Harvester (Supplier) Evaluation	Processor (Buyer) Evaluation
Threat of vertically integrating with other sector (See section on vertical integration for more detail)	+ Harvesters may vertically integrate by retaining ownership of fish while they are being processed (demanding custom processing services). + Harvesters may exert vertical influence by using QS to encourage new entry by processing concerns.	+ Increased incentive. - Threat limited by accumulation limits - Possible reduced vertical integration for firms with strong vertical integration.
Business sector concentration (See #1 of table on "rivalry" for more detail)	+ Increased concentration. + Reduction of potential for competition through activation of latent permits.	- Expanded geographic area of "local" markets (QP liquidity). + Pressure for consolidation/integration - Consolidation/integration constrained by accumulation limits.
Switching Costs (processor to a different supplier or supplier to a different processor)	o	o
Processor customer power	o	N/A
Suppliers products are highly differentiated from one another	o	o

Table 13. Effects of IFQ program on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change)

Changes to Barriers to Entry	Harvesters	Processors
Government Regulation	+ Increased fixed costs. + Absolute barrier to entry and expansion	+ Increased fixed costs. Relatively minor compared to harvesters.
Special Proprietary Knowledge	o	o
Asset Specificity (Maleability)	o	o
Economies of Scale (fixed costs of attaining efficient production)	+ The cost of achieving any given level of scale will be increased by the need to acquire QS.	+ If processors in the industry acquire QS, the cost to new entrants to reach a similar level of scale and efficiency will be increased by the need to purchase QS. Accumulation limits create absolute barrier in ability to protect higher production levels through ownership of IFQ.

Harvesters. Regardless of who is given the QS, implementation of an IFQ program will result in a shakeout in the harvester sector, leading to consolidation of harvest among vessels in the long-term. If most of the harvest were also concentrated among a few of the remaining harvesters rivalry would be further reduced; however, accumulation limits would be expected to limit concentration. While we note that rivalry may be reduced, the IFQ system is not itself one in which intense rivalry among harvesters who acquire QS would be expected. In order to expand their market share harvesters would need to compete in two markets: (1) QS/QP market to gain the needed access rights and (2) the raw fish market.[21] Once a harvester secures QS/QP, the need to compete with other harvesters for a share of the raw fish market may be minimal (i.e., it is expected that, in general, the trawl groundfish allocation will be fully utilized—that markets will exist or be developed for all of the reasonably marketable catch).[22] Moreover, since a harvesters ability to expand revenue through increased harvest will be limited by their QS/QP holdings, there is a strong incentive for them to cooperate in price negotiations as a main means of increasing their revenue for the catch for which they have QS/QP.

Some harvesters may not acquire all the QS they need for their optimal production levels. If some QP is available from processors (e.g., those processors not using the QP holdings from their own vessels), the

[21] The need to gain access rights in the form of QS/QP and the effects on the market are closely related to the creation of a barrier to entry, discussed in the following paragraph.

[22] It is possible that for some species, such as Dover sole, supply may exceed demand at prices that harvesters are willing to make a delivery.

negotiations over QP and raw fish prices may be linked. The degree of direct competition and rivalry among harvesters for shares of the raw fish market will depend on the long-term distribution of QS among harvesters and processors.

Under the IFQ program, there is not likely to be latent license capacity for a processor to threaten to draw on if negotiations fail, affecting rivalry, bargaining power, and entry barriers. Under status quo, by using a latent permit a new harvester might be brought online without directly taking fish deliveries away from another processor.[23] The need to hold QS/QP forms an absolute barrier to entry and a new entrant can only come in to the degree that the production of an existing entrant is first removed through the acquisition of QS/QP. While the barrier to activation of latent capacity may increase the opportunity for a harvester with its own QS to exert power, harvesters may still need to be concerned about linkages between their harvest of groundfish and deliveries from other fisheries (e.g. Dungeness crab).

Categorization of fixed costs depends on the time frame of reference. For example costs may be fixed for a year, a trip or a day of a trip. An increase in fixed costs, particularly those related to compliance and costs that are fixed per day of fishing, such as observer costs, would be expected to increase rivalry in the QS/QP market but increase cooperation in the raw fish market.[24,25] Increased fixed costs will likely lead vessels to seek to expand their production per trip, requiring more QS/QP. However, if there is a willing buyer for any QS/QP acquired (i.e. vessels need not compete for a market for their raw fish), the increased fixed costs give vessels a greater incentive to coordinate marketing in the raw fish market in the hopes of generating higher profits to recover increased fixed costs.

Harvester market power may also increase with an increased opportunity to exert vertical control through (1) retaining ownership of fish and hiring custom processors, and (2) acquiring QS and using that QS to encourage new processors to enter the West coast market by guaranteeing raw fish deliveries. Custom processing has been seen in the IFQ system in British Columbia.[26, 27] This initial increase in vertical control through custom processing could allow vessels to develop some of the marketing expertise, which might then put them in a better position to more completely step into vertical integration by taking on direct ownership of processing facilities. If harvesters encourage entry of a new processor, that processor would still need to compete with existing processors in the wholesale market but their risk could be substantially reduced if harvesters with QS are willing to make long-term commitments.

With respect to entry barriers, there will likely be certain government required compliance costs, e.g. camera systems, which will raise the cost of entry. Harvesters wishing to achieve efficiencies related to any particular scale of production will also need to purchase an amount of QS commensurate with that scale of production (the effect of the initial allocation in this regards will be discussed in the section starting on page A-59.)

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[23] While the 2-month landing limits mutes some rivalry, under status quo if a licensed vessel holds out during negotiations, a buyer may be able to find another licensed vessel to make that delivery, activating a latent permit if necessary (there are a number of permits available that are not used or not used to their full capacity).

[24] The cost of the QS/QP itself does not represent a fixed cost because they can be sold (the QP in particular) during the season.

[25] With consolidation of production among fewer vessels, it is likely that some of the existing permits will go unused and may be available for purchase by new entrants (reducing the cost of entry with respect to permit price). However, the higher the fixed compliance costs for participating in the program, the more QS/QP a new entrant will need to buy to achieve the level of efficiency necessary to pay the cost of the QS/QP. The fixed costs and need to purchase QS/QP will result in a net increase in the cost of entry (barrier to entry)

[26] Cite for BC??

[27] Under a custom processing arrangement vessels retain ownership of the fish, which is processed for them under contract. The harvesters then sell the fish into the wholesale or retail market. In this way harvesters begin vertical integration and the capture of some rents from other parts of the production chain.

Processors. With an IFQ program rivalry would be expected to increase among processors for a number of reasons (note: this portion of the analysis does not take into account the effect of the initial allocation). First, processor rivalry may be increased by a decrease in the geographic isolation of markets which effectively increases the number of participants. In the discussion box below, a hypothetical construct is provided to explained how the liquidity of QP may link markets that had been previously geographically isolated, thereby expanding the number of participants. Table 16 through Table 19 provide information on processors that operate in multiple ports and the size of processors in each port as measured by their average mt for 2004-2006 for the whiting and nonwhiting fisheries. Second, the potential for increase in harvester market power will encourage firms to integrate horizontally and vertically. With respect to vertical integration, the opportunity to acquire QS may provide a lower-cost means for processors to (1) compete with one another for market share (foreclosing competitors' access to supply and consolidating processors' market shares), (2) vertically integrate to secure supply,[28] and (3) hold out during negotiations. While there may be more incentive for horizontal integration and consolidation, actual integration will be limited by accumulation limits. Finally, rivalry may also increase due to direct strategic conflict.

Direct strategic conflict would be associated with the foreclosure effect caused by any firm that tries to expand operations and the effects of accumulation limits on current industry structure and a firm's ability to horizontally and vertically integrate. With respect to the foreclosure effect, under status quo a processor can expand its operations by acquiring access to an unused or underutilized limited entry permit and vessel. Other processors are displaced indirectly as managers reduce vessel 2-month cumulative limits in response to the increased effort and processors compete with one another to sell their products in the wholesale market. Under IFQs, competition will be direct. A processor can secure more product only if the raw product going to a competitor is directly and immediately reduced (i.e., a competitor's market share is reduced by foreclosing its access to supply of a key input). Accumulation limits will alter the existing and potential horizontal and vertical integration, possibly shifting power balances within the sector and leading to strategic repositioning. Firms at their accumulation limits vying to maintain or increase production will have to compete with one another for the production of existing vessels with less latitude in the means available for securing harvest commitments (see paragraph below on the limits to vertical integration).[29]

[28] Facilitating planning for more efficient production.

[29] The situation under IFQs and status quo would be similar for vessels that max out their 2-month limits with deliveries to a particular buyer. One buyer can bid production away from those vessels only at the cost of a direct reduction in raw product delivered to another buyer.

Table 14. Relative efficiency based on size of firm and whether production is supported by QS.

	Processor Production	
Size of Firm	Supported by QS	Not Supported By QS
Production Level Above QS Control Limit	+++*	++?
Production Level Below QS Control Limit	Relative ++?	Efficiency?? +

*Can only occur through initial allocation (see subseauenst section).

For processors that are at their control accumulation limits, horizontal integration could occur only through the acquisition of firms that do not already control QS, and expansion (consolidation) can occur only through increasing the proportion of production unsupported by processor-owned QS. When at the control limit, a processor that expands decreases the portion of its production supported by QS controlled by the processor. Processors that are not at their limits may acquire additional firms that own QS or support expanded production with secure QS. Therefore, unless firms at their QS accumulation limits have other advantages (e.g., are already more efficient than firms that are below their accumulation limits, a gain enough efficiency through expansion to compensate for the costs and risks of production unspported by QS, or have better access to capital) it may be more likely that additional consolidation would occur among firms below the accumulation limits. Firms that do not have QS may be less expensive to acquire than those with QS, making them more likely candidates for acquisition by firms at their accumulation limits that wish to extend their horizontal integration. Section A-2.2.3-e provides data on the number of fish buying firms that would be expected to be above and below accumulation limits under various allocation formulas.

Processors at accumulation limits will be more likely to expand if, for them, the relative efficiency of an additional increment of production not supported by QS is greater than the same increment of additional production by a firm operating at a lower level of overall production (the upper right hand cell of Figure 7 is *greater* than the lower left hand cell). On the other hand, if the relative profitability is the opposite, it will be more likely that smaller firms will acquire QS and expand up to accumulation limits (the upper right hand cell of Table 11 is *less* than the lower left hand cell).

Processors at their accumulation limits will not be able to further integrate vertically like they have under status quo, i.e., through acquisition of harvesting vessels. Since control limits apply to both QS and QP, if a processor that is at the control limit decided to vertically integrate by purchasing a groundfish trawl vessel, it would not be possible to acquire additional QP to place on the vessel. The definition of control will also be important in determining the nature of harvester-processor relations. For example, if exclusive contracts for delivery are considered “control” then processors at their limits may not be able to enter into this type of contract with a harvester. At the same time, for processors not at the control caps it would be less expensive to vertically integrate though acquisition of IFQ (as compared to integration by acquisition of a vessel), increasing the viability of a threat by the processors to integrate vertically

While rivalry may increase for the reasons described above, some of the same factors will decrease bargaining power, specifically the decrease in the threat for backward integration due to the effect of accumulation limits and the expanded geographic scope of the market due to the liquidity of QP and interaction between the QP and raw fish markets. At the same time, the threat of the potential for harvesters to exert market power will provide incentive for increased cohesion among processors. However, processors’ ability to act together is very limited because of antitrust law constraints. Harvesters on the other hand are able to coordinate their marketing under provisions of the Fishermen’s Collective Marketing Act.

Those processors that own QS may be more competitive than those that do not (depending on acquisition costs); therefore, the possible need for new entrants to acquire some QS to be competitive may add to the cost of entry. Differences in processor profit opportunities before and after implementation of the IFQ program may create a short-term barrier. If existing processors retain some market power before implementation of IFQs and that market power still exists but at a diminished level after IFQ implementation, new entrants will be at a disadvantage in their ability to recover their investment compared with those who may have recovered their investments at a time of relatively greater profit.

The above paragraphs deal with conditions that would encourage or discourage the exertion of market power among processors. In this context, it should be noted that if the raw fish market is competitive before and after implementation of IFQs, and the processing sector is overcapitalized, that sector may bid away some of the profits associated with capital investment in order to secure access to harvesters and QS. The same may occur if processors currently have market power in the raw fish market, but not after IFQs are implemented. In both cases, a new entrant will face the situation of attempting to recover capital investment in an environment in which existing firms are not making enough profit to cover their capital costs. While this situation may present a barrier to entry, it is not relevant to the market power evaluation since the barrier only arises if processors have not been able to exert sufficient bargaining power.

Box: Decreasing the Geographic Isolation of Local Raw Fish Markets

Consideration of the factors influencing market power requires careful definition of the scope of the market and whether or not that scope changes with the implementation of an IFQ program. In the market for raw fish, part of a processor's ability to exert market power may be based on transaction costs that reduce mobility. The cost of moving resources between geographic areas or from one owner to another reduces mobility, or in some sense, creates "stickiness" in the system. This stickiness determines the scope of the individual markets. There may be numerous processors coastwide but if there is only one or a very limited number of processors in a particular port the processors in that port may have more bargaining power than if they compete on a coastwide basis. While they have some latitude to offer lower prices within a port, that latitude may be limited if there is a processor in another port willing to offer a higher price. In such a case, if the processor in the vessel's preferred port offers a price that is lower than the price available in an alternative port by an amount greater than the cost of delivering to the alternative port, the preferred port processor might lose that delivery.* In aggregate, if one processor operates in many ports coastwide, coordinating prices between its plants, and if that sector operates similar to other sectors with a single dominant player (with smaller processors following the prices of the larger processors, as described in Appendix C), then the opportunity for a vessel to find a higher price elsewhere along the coast may be limited.

The introduction of QP changes the situation by reducing the cost of moving production between ports, thereby reducing stickiness. QP may move from one port to another at relatively low cost. Consider a hypothetical status quo situation. With five ports Yellow, Red, Blue White and Orange (in north to south order), and processors in each port. Within each port there are only a few processors and the costs of moving fish between ports provides the processors in each port some latitude to follow price setting by the dominant processor in that port. If the dominant processor in each port is processor A, then prices may be coordinated among the somewhat separated markets. Now consider a QP market. Since QP can move easily between ports there may be really a single market for QP along a major section of the coast. Now if Processor A wants to offer a lower price for vessels delivering fish in say, Port Orange, vessels can consider transferring QP to a willing buyer in any one of the other ports without catching the fish themselves and delivering it there. With respect to relations with a particular vessel in Port Orange, Processor A needs to contend not only with Processor F and possibly D, but also with Processors C, B, and E. If anyone of those processors is willing to offer a higher exvessel price for the fish, the QP can easily be transferred to the alternative port, with the vessel in Port Orange receiving the higher profits associated with the QP.

Table 15. Hypothetical markets for raw fish and quota pounds.

Raw Fish	
Market	Processors
Port Yellow	A B C
Port Red	A
Port Blue	A B E
Port White	A D
Port Orange	A F

Quota Pounds	
Market	Processors
Coastwide or Regional (e.g., north of 40 10)	A B C D E F

Whether the price setting situation hypothesized here exists and whether the additional mobility provided by QP is enough to break down such price setting is open for discussion. To the degree that processors are able to set and maintain an exvessel price close to the harvesters marginal costs, the processors will continue to capture some of the rents and the value of the QP will be diminished by that amount. Further, the processors will be in a stronger position to buy QS up to accumulation limits or negotiate strong contracts for delivery of QS fish.

There are some limits to QP mobility that influence the result and need to be considered: (1) there will be some transaction costs associated with the transfers (even if much less than for the movement of the vessels or fish), (2) there may be non-pecuniary benefits to fishing (lifestyle benefits associated with the fishing activity that are not financially rewarded) such that a fisherman will have some additional tolerance to fishing at a profit lower than what he might receive by not fishing and selling the QP in an alternative market (i.e., a fishermen might be willing to give up some of his quasi rents), (3) if this transfer of QP went on for a period of time and if the vessel owner were not able to cover its fixed costs through other fishing activities, then over time the vessel owner would reduce the size of its capital investment (the vessel owner would likely sell the vessel).

*Other factors would also come into play such as negotiations over the suite of raw product a vessel might want to deliver to its preferred port on a year round basis.

Table 16. Trawl non-whiting groundfish buyers active in multiple ports (A = active buyer in the port) and single ports (count of single port buyers in each port), and distribution their buying activities among ports (based on 2004-2006 fish tickets)

	Non-whiting Buyer Category*																
	Buyers Active in Multiple Ports and Ports In Which They Were Active													Number of Buyers Active in a Single Port		SubTotal	Total
Port	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	>10,0000 lbs	<10,0000 lbs	>10,0000 lbs	Buyers
Neah Bay						A								2		3	3
Blaine									A					1		2	2
Bellingham						A			A					1		3	3
West Port	A														2	1	3
Ilwaco														1		1	1
Astoria	A					A									3	2	5
Tillamook	A														2	1	3
Newport	A				A										4	2	6
Florence														1		1	1
Coos Bay	A	A			A									1	4	4	8
Brookings	A	A			A										1	3	4
Crescent City	A						A								2	2	4
Eureka	A		A													2	2
Fort Bragg	A	A	A												1	3	4
Bodega Bay	A	A	A		A											4	4
San Francisco	A		A	A			A				A	A			2	6	8
Oakland		A														1	1
Princeton		A	A											3	5	5	10
Santa Cruz															3	0	3
Monterey												A	A	1	1	3	4
Moss Landing		A		A				A			A		A	1	4	6	10
Morro Bay				A			A	A		A				1	6	5	11
Avila				A												1	1
Santa Barbara										A						1	1
Total	11	7	5	4	4	3	3	2	2	2	2	2	2	13 Buyers	40 Buyers		102

* The 10,000 pound threshold is an average per year.

Table 17. Number of non-whiting buyers by average level of landings received during 2004-2006

Port	<10,000 lbs	10,0000 - 20,000 lbs	20,000 - 100,000 lbs	100,000 lbs - 100 mt	100 mt - 500 mt	500 - 1,000 mt	>1,000 mt	Subtotal >100,000 pounds	TOTAL
Neah Bay		1	1		1			1	3
Blaine			1			1		1	2
Bellingham			2				1	1	3
West Port	2				1			1	3
Astoria/Ilwaco	3	1					2	2	6
Tillamook	2		1					0	3
Newport	4				1		1	2	6
Florence/ Coos Bay	5	1		1			2	3	9
Brookings	1	1		1		1		2	4
Crescent City	2			1	1			2	4
Eureka					1		1	2	2
Fort Bragg	1		1		1	1		2	4
Bodega Bay	3		1					0	4
San Francisco Bay & Princeton	10	1	4	1	3			4	19
Santa Cruz	3							0	3
Monterey	2		1		1			1	4
Moss Landing	4	1	1	3	1			4	10
Morro Bay/Avila & Santa Barbara	8	2		1	2			3	13
TOTAL	50	7	14	8	13	3	7	102	154

Table 18. Trawl shorebased whiting buyers active in multiple ports (A = active buyer in the port) and single ports (count of single port buyers in each port),and distribution their buying activities among ports (2004-2006).

	Whiting Buyer Category*			
	Buyers Active in Multiple Ports and Ports In Which They Were Active			
Port	B1	B2	Buyers Active in a Single Port	Total Buyers
West Port			1	1
Ilwaco			1	1
Astoria	A	A	2	4
Newport	A		2	3
Coos Bay	A		2	3
Crescent City			2	2
Eureka	A		1	2
Moss Landing		A		1
Totals	4	2	9 Buyers	17

Table 19. Number of whiting buyers by average level of landings received during 2004-2006

Port	<100,000 lbs	100,000 lbs – 1,000 mt	>1,000 - mt	TOTAL
West Port			1	1
Ilwaco			1	1
Astoria		3	1	4
Newport			3	3
Coos Bay	1	1	1	3
Crescent City		2		2
Eureka	1		1	2
Moss Landing	1			1
Totals	3	6	8	17

Access to Capital (Demand) - Discount Rates

The purchase of QS requires access to financial capital. Such purchases may occur through wealth that a firm or individual already holds or through the commitment of future earnings in return for access to capital held by someone else (e.g., commitment of future payments in return for a loan from the bank). The focus of this section is on factors that affect how much individuals and businesses are willing to pay for access to capital (demand) and how that affects their access to QS. The focus of the following section is on factors that affect how much lenders are willing to supply capital and how that affects the ability of individuals and businesses to get loans for the purchase of QS.

All else being equal, QS will flow toward people or businesses that have a low discount rate (Francis, *et al.* 2007). (Note: personal discount rates are related but different from market interest rates that must be paid to borrow. Interest rates will be discussed in a following section). Discount rates play a major role in determining how much an individual is willing to pay for QS. The value of QS represents the expected income stream from QP issued for that QS, discounted based on preferences between future and present income. People or businesses who have a strong preference for earnings in the current year as opposed to future years are said to have high discount rates. Here we will first discuss discount rates in general and then discuss factors affecting discount rates, including;

- Time preference
- Risk

To illustrate the effect of differential discount rates of QS values, consider a person who places a relatively high value on current consumption as compared to next year's consumption, say a 25 percent discount rate. That person would prefer to receive $80 this year rather than waiting and receiving something less than $100 next year ($80 + (25 percent x $80) but would give up $80 this year in order to gain something more than $100 next year. Now to illustrate the effect of differences in discount rates, consider an amount of QS that is expected to generate $100 of net revenue each year. To simplify this illustration we will limit the duration of time considered to 5 years. Now assume there are individuals with discount rates of 5, 10, and 20 percent. The following table shows how much these individuals would be willing to pay for the QP in each subsequent year and in total, assuming that they had to buy QP for all five years up front. As can be seen, a person with a discount rate of 5 percent would be willing to pay $452 now for the QS compared to $269 that a person with a 20 percent discount rate would be willing to pay for that same QS (i.e., the person with the lower discount is willing to pay 68 percent more).

Table 20. Example of the effect of personal discount rate on willingness to pay for a 5 year stream of revenue.

		Year					Present Value
	Personal Discount Rate	1	2	3	4	5	(5 years summed)
				Values by Year($)			
	Nominal Value	100	100	100	100	100	
Person A	Discounted Values at 5%	100	95	90	86	81	452
Person B	10%	100	86	73	63	53	375
Person C	20%	100	68	47	32	22	269

The persons with lower discount rates are likely to pay more for QS even if they expect to derive similar revenue. The following sections discuss factors affecting personal discount rates.

Literature based on IFQ trading shows fishermen have fairly high discount rates (Asche 2001). The following table displays the relationship between the ratio of QS value and QP value and the implied discount rate.

Table 21. Discount rate associated with different relationships between quota value and QP value (adapted from Asche, 2001)

QS/QP Value	3/1	4/1	5/1	6/1	10/1	11/1	15/1
Discount Rate	0.50	0.33	0.25	0.20	0.11	0.10	0.07

In the mid 1990s, ratios reported for the Iceland IFQ system varied from 3.5/1 to 9.2/1 depending on the species. This would place discount rates at between 11 percent and 50 percent. These rates would be determined by those able to participate in the market. In Iceland, the system is designed to discourage absentee ownership of ITQ (ownership by those who do not participate as harvesters). Therefore, the rates may better reflect time preferences of fishermen. If members of other sectors of the fishing industry or the broader economy also participated in the market, the ratios might be different. We will now look at some factors that influence the general discount rate.

Personal Time Preferences

We are using the term "time preference" here to reference personal time preferences unrelated to risk and other factors that influence discount rates. Factors affecting time preference include income, wealth, innate patience, and education (Becker and Mulligan 1997).[30] Individuals with low income will often have higher time preferences (value current consumption over future consumption) due to a greater desire to meet immediate needs. Research on fishermen time preferences is available but limited. When asked simply to respond to hypothetical profit decreases and increases for a series of years, fishermen in the north Irish Sea answered in ways that indicated a range of time preferences that were fairly high (Curtis 2002). Thirty seven percent of all fishermen had discount rates of greater than 50 percent and 40 percent had discount rates of between 30 percent and 50 percent. It seems likely that crew members will be less wealthy than business owners and therefore more likely to discount future earnings and less likely to acquire QS. Level of expected future income also affects time preference (if one expects income to be rising in the future, one may have a higher preference for current consumption). Similar to an individual, managers of a business under financial stress may place a higher value on current income that is needed to survive, as compared to the value that a healthier business might place on current relative to future income. Simple patience is another personal characteristic affecting time preference. The IFQ system itself, independent of the initial allocation, is not expected to directly affect personal time preferences.

Risk

The aspect of "risk" of concern here is a person's assessment of future risk. Considerations include ability to enjoy/utilize future income and personal assessment of the likelihood that future earnings will be realized. Those who face greater risk in their activities or otherwise believe the future is riskier will discount QS and be less likely to buy than those who see more certainty, unless the acquisition of QS overcomes that risk. The IFQ program will create an opportunity for individuals (e.g., crew), businesses or other entities (e.g., communities) to increase the security of their income by acquiring QS to ensure access to harvest. A QS owner may both earn income from the sale of the QP associated with the QS as well as earn some additional security if they are leasing it to themselves, or using it as leverage to ensure access to employment or other economic activity (e.g., a community ensuring the continuation of fishing activity in its port). This is closely related to risk reduction through vertical integration, discussed in a previous section (page A-33). Assessments of the degree to which ownership of QS might increase security will also involve consideration of the likelihood that there will be changes to the program or changes in the fishery resource. Other factors affecting risk under IFQs are discussed in Chapter 4. These include a harvesting firm's assessment of the risk that it will encounter a disaster tow for a limiting overfished species or that another vessel will encounter such a tow and cause portions of the trawl IFQ fishery to be closed, even though some QP have not been harvested.[31]

Access to Capital (Demand) – Planning Horizon and Investment Recovery

Another factor determining the value a person will place on QS is the length of time over which the person will value the asset. A person with a shorter planning horizon will tend to place a lower value on QS. Future resource rents can be captured by the firm at any time through the sale of the QS (assuming competitive sectors). Therefore, in order for the planning time horizons to make a difference, the firm must be earning

[30] Note: Individuals who expect to have higher incomes in the future or have less utility for income in the future (e.g., the anticipation of a more limited ability to enjoy the income) will also have higher discount rates than those without such expectations.

[31] Another aspect of risk is simply the risk a person attributes to the possibility that in the future they will not be around or have less ability to enjoy the income than they do in the present.

some rents that are not reflected in the QS value (representing resource rents) or place some additional value on the QS which will not be captured in sale of the QS. To illustrate, assume that:

- there are two individuals who each have a discount rate of 5 percent (person A in the previous example)
- they both own QS and earn resource rents (the difference between P1 and P2 in Figure 7)
- they are equally efficient and earning intramarginal rents (the difference between Pi and P1 in Figure 7)
- the $100 value that they anticipate earning each year is derived from owning the QS (rents) *and* participating in the fishery (intramarginal rents)

When they leave the fishery they will be able to sell their QS and capture future resource rents. However, they will no longer capture the intramarginal rent. If we assume the intramarginal rents are $20, that the general market price for the QP is $80, and that a person plans on leaving the business after 3 years,[32] that person would value the QS at only $419 as compared to $452 for someone who plans to remain in the fishery for all 5 years (the actual time horizons over which QS is valued is likely longer; the 5-year horizon is being used to illustrate the concept).

Table 22 Example of the effect of planning horizon on willingness to pay for a 5 year stream of revenue (both cases assume that QS is sold at the end of the 5 year period but that Person A-2's intramarginal rents are based on exceptional fishing skill and will not be captured upon sale of the business).

		Year					Present Value
	Personal Discount Rate	1	2	3	4	5	(5 years summed)
		Values by Year($)					
Person A-1	Nominal Value	100	100	100	100	100	500
	Discounted Values at 5%	100	95	90	86	81	452
Person A-2	Nominal Value	100	100	100	80	80	$460
	Discounted Values at 5%	100	86	73	69	65	419

In this example we have considered a planned exit. Other factors may also affect planning horizons, for example, the amount of time required to recover the cost of a capital investment. If one of the reasons a firm holds QS is to increase its security in recovering on a capital investment, the longer it takes to recover on that capital investment the longer the stream of benefits the firm will necessarily take into account and the more it may be willing to pay for the revenue security the QS provides, as compared to other firms that have a shorter time horizon.

ACCESS TO CAPITAL (SUPPLY)

The main concern here is what it costs to borrow money (access to capital) for the purchase of QS. These costs are generally reflected in the interest rates charged by lending institutions. Risk, at the industry and borrower level, are major determinants of willingness to lend. At the industry level, an IFQ program is expected to reduce risk by stabilizing the industry economically, allowing for better long-term planning, and improving stock conservation through improved information and more precise control over total removals. The IFQ program may also increase the potential for harvesters to exert market power, thereby increasing the risk that processor profits may decline, and so, all else being equal, the cost of capital for processors could increase.

[32] Also assumed here is that the source of the person's intramarginal profits is such that he/she will not be able to capitalize on those profits through sale of the business (receive a price for the firm that takes into account the firm's greater efficiency relative to other firms). An example of this would be if the individual leaving the industry is also the vessel operator and the source of his/her rents is superior skill.

At the individual firm level, some of the factors that affect willingness to lend are the borrower's equity (including the liquidity of that equity), size, diversification, and viability of their business plan. The nature of a firm's equity determines the firm's ability to offer up collateral as security for a loan. When a loan is sought for the purchase of an asset, the asset itself sometimes serves as security for the loan (e.g., borrowing for a real estate purchase). Our primary concern here is a firm's access to capital under an IFQ program and how that affects QS flow. Access to capital is necessary for the purchase of QS and, if a firm does not already have the capital, it will need to borrow money if it wants to purchase QS. For the purpose of securing a loan to purchase QS, the QS itself may be of limited use because the value of the QS may fluctuate with changing stock conditions, prices, and regulations (including increases in costs caused by regulations and possible changes to the QS system). In making a determination on whether or not to lend for the purchase of QS, because the value of the QS may be somewhat tenuous, a lender is more likely to evaluate the loan applicant's overall financial condition, including total equity and its liquidity. A firm without QS or with insufficient QS to support its business plan will be viewed as a higher risk.[33] Thus QS may be of limited value as security for the loan itself but ownership of QS may reduce the firm's risk profile, giving it cheaper access to capital secured by other assets.[34]

In evaluating the liquidity of a firm's assets, one of the factors that banks consider for the fishing industry is whether an asset can be used outside the industry (is malleable to other uses). In general, harvesting firms tend to have fewer assets usable outside the fishing business, relative to processing firms. Fishing firms generally have a vessel and vessel-related assets (gear) and may have some shorebased equipment (e.g., a truck). Processing companies may own a number of assets that are not industry specific, potentially including land, buildings, cold storage, heavy equipment (e.g., lift trucks), trucks and cars. It should be noted that for some companies some of these assets may be leased (e.g., land and buildings in a port).

Size and diversification of the firm are other factors considered in evaluating risk. Processing companies tend to require greater capital investment than harvesting companies. Their business operations may also be more diversified in that some assets may be used temporarily in non-fish industry employment (e.g., cold storage); and they may satisfy customer needs and to some extent utilize processing capacity with product from outside the geographic region. On the other hand vessels are more mobile and so have some opportunity for diversification through geographic relocation.

Table 23. Influences of the IFQ program on QS flow through effect on demand and supply of capital.

	Harvesters	Processors	Crew	Communities
Demand for Capital				
Time Preference	Those with high time preference will not be willing to pay as much for QS..			
	Indication of high time preferences.	Uncertain	Low income may lead to high time preference.	Uncertain
Risk	Those who believe that the future holds greater risk than others believe will have a lower willingness to borrow, unless ownership of QS overcomes the risk. The fishery managed with IFQs will have inherently less risk. No basis to distinguish among groups.			
Planning Horizon and Investment Recovery	Those who have a longer planning horizon for the use of an asset may be willing to pay more to acquire it (as compared to someone acquiring the same asset with a shorter horizon). (This outcome depends on there being a limited ability to recover investment through sale of the asset at the end of the planning horizon.) No basis to distinguish among groups.			

33 Not receiving a sufficient allocation in itself would raise a question in the lender's mind as to the status of the firm in the industry and viability of its business plan.

34 Anonymous interviews with bank lenders and industry analysts. March 2008.

	Harvesters	Processors	Crew	Communities
Supply of Capital	The overall financial position of a firm will be evaluated in determining loan worthiness. Firms are likely to receive more favorable terms for a loan if they are larger, diversified, and have assets that may be used as security and are of value outside the industry. In general, the IFQ program will likely decrease risk in the industry. QS are of tenuous value as collateral but important to the viability of a firms business plan. Firms with cheaper access to capital will be more likely to accumulate QS.			
	Harvesters less likely to have capital useful in other industries. Of generally smaller total size than processors. Risk and cost of accessing capital may decrease with greater stability and possible increase in market power.	Firms more likely to have capital that may be useful in other industries Firms often of larger size than harvesting firms. Processors may experience a risk increase associated with harvester market power, increasing the cost of accessing capital.	Not likely to have fishing business related assets for use as collateral. This may mean higher costs of borrowing.	May have cheaper access if the governing body is viewed as lower risk.

♦ *Summary of Influences on the Flow of IFQ among Groups and Effect of Initial Allocation of QS*

The following is a summary of the general way in the flow of QS is influenced by the initial allocation for each of the above topics.

- **Relative efficiency**. Initial allocation will provide an infusion of capital. Those receiving an initial allocation will have an opportunity to make investments to increase their efficiency over competitors. One area in which investments may be made is in vertical integration. Greater profits will then enhance their ability to accumulate more QS up to accumulation limits.
- **Vertical Integration**. Under IFQs there will be an increased incentive for vertical integration. Those receiving an initial allocation will experience an increase in resources to support vertical integration (for processors this includes the acquisition of QS). If there is a grandfather clause, initial allocations may lock in certain efficiency advantages among firms, until the grandfather clause expires. However, to the degree that control accumulation limits are effective, this differential will not allow the firms at their accumulation limit to acquire more QS, moreover, firms with existing vertical integration could be weakened.
- **Market Power**. An increase in market power among those receiving an initial allocation will increase their profits and ability to acquire additional QS. The initial allocation will affect within-sector rivalry, bargaining power, and barriers to entry.
- **Access to Capital**. Those receiving an initial allocation will have enhanced access to capital, which will in turn allow them to accumulate QS more rapidly. An initial allocation may increase the recipients' demand for capital and it may be less expensive for them to acquire capital (lower borrowing costs) and thereby QS.

The following text and tables review these results in more detail, discussing some of the differences between sectors. Where there are a number of contingencies which will determine the expected outcome, key questions are provided to help the reader develop their own assessment of expected outcomes. A final summary table provides an overview of differences in the outcomes for harvesters and processors.

RELATIVE EFFICIENCY

For initial recipients, the initial QS allocation, if used fully, will give them an ongoing advantage over those who did not receive an initial allocation. The initial allocation constitutes a "free" infusion of capital and all else being equal, the firm receiving that infusion will experience greater opportunity to increase efficiency compared to firms not receiving an initial allocation. For example, assume there are two firms that have similar relative costs and revenues but the first receives an initial allocation of QS and the second does not. If industry profitability allows the second firm to purchase QS with the expectation of being able to recover its investment in the QS, then it is implied that the firm receiving the initial allocation of QS will have a similar opportunity to make a capital investment and either expand its operations through the acquisition of QS (in addition to its initial allocation) or make other acquisitions to enhance its business activities. If this investment further advances that firm's efficiency it will then have a competitive advantage in the acquisition of additional QS or in other areas of competition. In this way, the initial allocation may create a self perpetuating and potentially expanding the difference between firms receiving and not receiving the allocation.

Table 24. Influences of status quo, IFQ program, and initial allocation relative efficiency on profit distribution and QS flow. (shaded cells repeats information in previous sections).

	Harvesters	Processors
Status Quo	At a competitive equilibrium, both sectors would be expected to have comparable profit levels. Because a full competitive equilibrium is never reached, in every sector there are some firms that are more profitable than others and one sector as a whole may have greater profits than the other. Changes in the fishery may affect profits for firms in each sector differently. For example, the effect of the contraction of the fishery in the last decade may have affected harvesting and processing firms to different degrees.	
IFQ Program	IFQs are another change that is expected to affect the sectors differently. If one sector gains more efficiency than the other, all else being equal we would expect that initially QS would flow toward the sector that has a greater efficiency gain. In the short term, the IFQ Program will probably provide more direct opportunity for vessels to increase their efficiency than for processors.	
Initial QS Allocation	***A self perpetuating "leg up."*** *The initial allocation constitutes a "free" infusion of capital and all else being equal, the firm receiving that infusion will experience greater opportunity to increase efficiency compared to firms not receiving an initial allocation.*	

Note 1. An initial allocation to crew members or communities might also give them a leg up in an effort to accumulate wealth.

Key questions to assess the direction of future QS flow are:

- At present, do we believe that one sector tends to be more efficient than the other?
- Do we think that one will gain more efficiency under IFQs than the other?
- If there is a difference between the sectors and the less efficient sector is gaining efficiency, do we think the gain will be enough to overcome the initial deficit?

VERTICAL INTEGRATION, QUASI RENTS, AND ECONOMIC RENTS

The initial allocation of QS will be an asset that processors may use to increase their vertical integration, placing them in a stronger financial position and strengthening their competitive stance.

Under the grandfather clause, processors (buyers) receiving an initial allocation of QS (based on permits they hold or direct allocation for processing history) that is in excess of the accumulation limits will have a unique advantage over later entrants who will not be able to achieve the same level of vertical integration. However, while that advantage will allow them to horizontally integrate (albeit with the support of QS for the expanded operation) or otherwise increase their competitiveness, because of control accumulation limits they will not be able to acquire more QS beyond the grandfather clause ceiling. Once the business ownership changes, the grandfather clause expires and the amount in excess of the accumulation limit will flow back onto the market. When 25% of the QS is allocated to processors, a greater proportion of the QS received by processors will be in excess of the of accumulation limits than that owned by firms that harvest only (compare the first rows of Table 43 and Table 44). The more allocated directly to processors the more of the total QS will be held by firms in excess or accumulation limits. Because any QS that a firm at its accumulation limit divests itself of cannot be repurchased, the QS held by those over accumulation limits is more likely to remain off the market than QS held by those below the accumulation limits.

If there is not a grandfather clause an already strongly vertically integrated company may be weakened by the need to divest itself of harvesting assets. One aspect of the competitive position among processors would be evened out; all processors (existing and new entrants) would be restricted to the same amount of vertical integration. This change in the within sector strength of competitors would affect the future distribution of QS within the processing sector.

Table 25. Influences of status quo, IFQ program and QS initial allocation on vertical integration and QS flow (shaded cells repeats information in previous sections).

	Harvesters	Processors
Status Quo	Reasons for vertical integration are: market security, protecting profits associated with specialized assets, rent (profit) capture, and market foreclosure (pre-empting a competitor's access to a market). Under status quo, firms can acquire assets to engage on either side of the raw fish market (harvesters can acquire processing assets and processors can acquire harvesting assets). Expansion into the other sector also requires management time and expertise. In practice there appears to be more acquisition of harvesting assets and little significant entry into processing by harvesting firms.	
IFQ Program	Harvester vertical integration will not be constrained by accumulation limits. Vertical integration for harvester is covered more completely under market power.	Under IFQs vertical integration and QS access motivated by vertical integration may increase as follows: • The opportunity to own QS may provide a less expensive way for processors to respond to existing pressures for vertical integration (ensuring market security or protecting unmalleable assets). • As harvester profits increase harvesters may become more of a target for vertical integration. • The exclusivity of QS provides a new opportunity for processors to increase their market share by acquiring QS and thereby foreclosing the opportunity of competing processors At the same time, accumulation limits may substantially limit processor ability to vertically integrate and could even reduce existing levels of vertical integration. Accumulation limits would prevent processors from supporting as great a proportion of their production as harvesters, because on a per operation basis processors handle larger volumes than harvesters. Vertical integration through direct ownership of vessels would also be constrained by accumulation limits because any QP put on the vessel would count against a processor's accumulation limits. Any processor with vessel capacity that substantially exceeds the accumulation limits may divest themselves of some of those vessels.

	Harvesters	Processors
Initial QS Allocation	*Firms receiving an initial allocation will be in a stronger financial position to vertically integrate, thereby strengthening their financial position and competitive stance.*	
		Under the grandfather clause, processors (buyer) receiving an initial allocation of QS that is in excess of the accumulation limits will have a unique advantage over later entrants. However, accumulation limits will prevent those grandfathered in from using that advantage to acquire QS. Once the grandfather clause for those QS expires there will be a new flow of QS onto the market. *The more allocated directly to processors the more of it that will be held by firms in excess or accumulation limits, and because any QS divested cannot be repurchased, the QS held over accumulation limits is more likely to remain off the market than QS held by those below the accumulation limits.* *If there is not a grandfather clause an already strongly vertically integrated company may be weakened by the need to divest itself of harvesting assets and affect the future distribution of QS within the processing sector.*

Key Question:

1. If there is no grandfather clause, to what degree will smaller processing companies be strengthened? If larger companies receive fewer QS and if there is a relative strengthening of smaller companies, would those companies use that strengthening to buy QS up to the accumulation limits?

MARKET POWER, HORIZONTAL INTEGRATION, AND CONSOLIDATION

To simplify the discussion in this section we will address the initial allocation issue from the perspective of the effect on QS flow in the long term as the amount of QS allocated to processors. Our concern in that regard is how the initial allocation affects market power. The more market power a sector has the more likely it is that QP will flow toward that sector.

For harvesters, as the amount of the initial QS allocation to harvesters declines and that to processors increases competition in the raw fish market will increase. If processors cannot reach agreements with existing participants latent permits may be activated to meet processor needs, increasing the number of participants. The financial health of the largest producing vessels and financially weakest firms will be diminished. The largest producing vessels will not achieve the level of production they would have under the grandfather clause if there had been a 100 percent allocation to harvesters.[35] Therefore, the initial distribution will likely be closer to the long-term distribution with respect to the level of concentration of harvest among firms. To achieve previous production levels, the weakest firms will have to borrow more money to acquire QS or enter into raw fish delivery price negotiations with processors in a weaker position. This will likely move the harvesting sector through its shakeout and adjustment period more quickly. Any QS received will reduce the barrier to exiting; thus, as the amount harvesters receive goes down, the incentive to stay in the fishery will increase. A more rapid adjustment period with more stress on financially weak firms and higher exit barriers will increase strategic stakes, and rivalry will be more intense during initial phases of the program. Negotiations with processor for access to processor-held QP may be an important in determining which harvesting firms survive. With less of an initial allocation, harvesters will be in a somewhat weaker position with respect to the assets they have available to threaten more vertical integration as part of their price negotiations. The initial allocation will also provide harvesters with a competitive advantage *vis a vis* new entrants. On the one hand, that advantage diminishes as the amount of QS going to processors increases; on the other hand, the importance of the initial allocation as an advantage in competition in the raw fish market for access to processor-held shares increases as the amount of the QS going to harvesters increases.

[35] Processors do not need QP to produce and so can achieve their historic production levels even if they do not receive an initial allocation.

The grandfather clause has less significance for competition within the harvester sector than it does within the processing sector. Within the harvesting sector, the vessels with the grandfather clause will have a cost advantage but will not be able to use that cost advantage to compete for QS or in the raw fish market because they will not be able to add QS or QP to their existing holdings.

With respect to rivalry within the processing sector, rivalry generally decreases as the concentration of market shares increase. It is likely that market share concentration will be influenced by the concentration of the initial allocation of QS. Some processors own permits and will therefore receive an initial allocation regardless of whether or not there is an explicit allocation to processors. If there is no direct allocation to processors there will be a strong skewing of the initial distribution. QS will be most evenly distributed among processors if there is an allocation to processors but no grandfather clause. If more is allocated to processors and there is a grandfather clause, more of the QS will be concentrated among larger processors. How rivalry will affect allocation with a grandfather clause, as compared to an allocation without a grandfather clause, is uncertain but some insight may be gained through quantitative information (to be developed). For processors that would not receive enough initial allocation to put them above the accumulation limits (smaller processors), an initial allocation to processors will increase security of their access to raw product and put them in better position to acquire additional QS and compete with larger processors.

The initial allocation will also lower the exit barrier, providing compensation for leaving the fishery and reducing the intensity of the competition to remain in. Those choosing to leave the fishery will provide remaining participants an opportunity to consolidate and expand operations. At the same time the additional endowment will also give all existing processors receiving an initial allocation an advantage over any new entrant (raising the entry barrier). For larger processors in particular, the initial allocation (with a grandfather clause) will provide an opportunity to produce at a larger scale with a lower risk profile, increasing the competition barrier for new entrants. Over time, a decreased exit barrier and increased entry barrier would be expected to increase consolidation.

With respect to processor bargaining power, as the amount of QS allocated to processors increases, their position in negotiating raw fish prices with harvesters will improve, because of their option to use their own QP on their own vessel or to activate a latent permit. If all QS goes to harvesters, for as long as the QS remains in harvester hands, at least initially, direct harvester competition for market share in the raw fish market should be minimal to nonexistent.

The initial allocation also provides an asset to support increased vertical and horizontal integration by smaller companies. Those receiving large amounts of QS would be limited in their ability to use it to acquire QS because of their accumulation limits. However, even for those larger initial recipients, the capital infusion could provide an advantage in the acquisition of processors that do not hold QS. Whether this occurs would likely depend on the relative efficiency gain when a large processor acquires a new facility without additional QS to support production at that facility as compared to a smaller company acquiring the same facility but with the benefit of QS to support the production. If the efficiency gains for a large company expanding without QS are sufficient then the capital infusion represented by QS may allow them to aggregate additional processing operations.

Table 26. Influences on rivalry of status quo, IFQ program and QS initial allocation (as more QS goes to processors) (shaded text repeats previous tables) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change

Factor Causing Greater Rivalry		Harvesters	Processors
1. A larger number of firms with similar market shares	Status Quo	+ Under status quo: larger than number of processors. + Entities with similar market shares. Potential sector participants include latent permit holders.	- Small number of firms. Very restricted in some localities. Market shares highly concentrated, going mainly to a few companies.
	IFQS	- A decrease in the number of active harvesting vessels and harvesting companies (subject to accumulation limits). Much of the rivalry for market share will be focused on the QS/QP market. However, for harvesters who do not own their own QS this competition may also involve rivalry in the raw fish market. - Limited opportunity for latent capacity in the sector to become more active, except through • QP provided by processors or others. • direct voluntary reductions by active vessels through QS/QP transfers.	+ Decreased geographic isolation of markets, increasing number of participants. + Some pressure for consolidation in response to existing overcapitalization and threat of harvester market power. - However, if there are effective accumulation limits growth of market share for larger firms will have to occur without the advantage offered by QS ownership.
	Initial QS Alloc	*+ Latent permits may be activated to handle processor owned QP, increasing the number of participants.* *As more QS goes to processors, and those processors receive more allocation than can be serviced with processor owned vessels, then there will be more competition among harvesters for the opportunity to utilize latent capacity to deliver raw fish on processor owned QP.* *The long term distribution may be achieved more quickly in that there will not be as many permits receiving QS as high above the accumulation limits.*	*? Concentration of market shares will be influenced by the QS allocation. If there is a grandfather clause there will be greater concentration of the QS allocation among processors regardless of whether there is an initial allocation to processors (because of processor held LE permits). If there is no grandfather clause, an allocation to processors will result in a more even distribution of QS. the grandfather clause expires.. The initial allocation will be an asset to support growth for smaller firms. For larger firms (at accumulation limits) use of the initial allocation as an asset to support further horizontal consolidation will depend on the relative incremental efficiency of a large firm expanding without QS compared to a small firm expanding with QS.*
2. Slow market growth	Status Quo	+Yes	+Yes
	IFQs	o	o
	Initial QS Alloc	o	*o*
3. High fixed costs	Status Quo	+Yes	+Yes
	IFQs	+ Increased fixed costs (e.g. camera systems), but for harvesters with QS the increase influences rivalry in the QS/QP market more than the raw fish market. - Incentive to exert market power in the raw fish market to increase profits and recover fixed costs.	o Minor increase relative to vessels.
	Initial QS Alloc	*o*	*o*
4. High storage costs or highly perishable products	Status Quo	+Yes	+Yes
	IFQs	o	o
	Initial QS Alloc	o	*o*

Factor Causing Greater Rivalry		Harvesters	Processors
5. Low cost for customers to switch suppliers	Status Quo	+Yes	+Yes
	IFQs	o	o
	Initial QS Alloc	o	*o*
6. Low levels of product differentiation	Status Quo	+Yes	N/A
	IFQs	o	o
	Initial QS Allocation	o	*o*
7. Strategic stakes are high	Status Quo	+Moderate for nonwhiting, high for whiting	+Yes
	IFQs	o	+ Increased strategic stakes, expansion requires direct displacement of competitors, more limited vertical integration opportunities.
	Initial QS Alloc	*+ Increase as more goes to processors. More rapid shake-out. Those able to partner with processors to acquire QP and increase scale of their operations are more likely to survive over the long term.*	*Change and uncertainty may increase action based on perceived strategic stakes.*
8. High exit barriers	Status Quo	+Yes	+Yes
	IFQs	o	o
	Initial QS Alloc	*+As more of the initial allocation goes to processors, exit barriers will be higher. Selling the QS may be a way to clear off debts/accumulate savings and leave the fishery.*	*-Reduced exit barriers*
9. A diversity of rivals	Status Quo	o Uncertain	o Uncertain
	IFQs	o	o
	Initial QS Alloc	o	*o*
10. Industry Shakeout.	Status Quo	- Constrained by management system	o Uncertain
	IFQs	+ Expected	o Possible
	Initial QS Alloc	*+As more goes to processors, the intensity of the initial adjustment and shakeout will increase. The adjustment may be rapid adjustment: there will not be as many firms as high above the accumulation limits (assuming a grandfather clause); financially weaker firms will drop out more quickly.*	*The initial distribution will alter the balance of competitive advantages among existing processors and may lead to new entry, a shakeout, or stabilize existing participants.*
Summary	Status Quo	Many reasons to expect high rivalry. However, license limitation constrains threat of new entrants; and for nonwhiting, 2-month limits minimize opportunity to compete for market share	Many reasons to expect high rivalry. However, high concentration indicates shakeout may have already occurred; and threat of intense competition may discourage strong moves to expand market shares.
	IFQs	After an initial shakeout , rivalry will decrease with fewer harvesters and accumulation limits constraints. The need to cover fixed costs may stimulate rivalry in the QP market and cooperation in the raw fish market. Rivalry in the raw fish market will occur to the degree that processors offer harvesters their QP, linked with raw fish exvessel price negotiations.	Rivalry will increase as a decrease in the geographic isolation of raw fish markets expands the number of effective participants, processors position themselves to defend against the possible exercise of harvester market power, competition for market share requires direct displacement of other processors, and accumulation limits constrain existing and potential vertical and horizontal integration.

Factor Causing Greater Rivalry		Harvesters	Processors
	Initial QS Alloc	*+As more QS goes to processors, rivalry in the raw fish markets will increase as harvesters vie for processor held QP needed to achieve the larger scale of operations and efficiency needed survive the initial shakeout. Exit barriers will be higher increasing the intensity of the competition to remain in the fishery.*	*Quite a bit of uncertainty about effect, some of it related to the decision on a grandfather clause for processors. Some shift in the balance of power within the sector could lead to a shake up (particularly if larger firms are disadvantaged).*

Key Questions:

Which will be more profitable, taking into account variation in risk:

- A processing facility purchased by a small company that is able to also acquire QS for a significant amount of the facility's raw product needs,
- Or the same processing facility purchased by a larger processing company that is not able to acquire additional QS to cover the facility's raw product needs?

If the former is more profitable, the IFQ program may inhibit further consolidation in the processing sector. If the latter is more profitable consolidation may continue and may be accelerated with the infusion of capital represented by IFQs (depending on balance with other factors such as changes in harvester market power and ability to vertically integrate).

Will there be a grandfather clause for processors? If not, an initial allocation to processors may advantage small processors relative to a larger processors.

Bargaining Power

Table 27. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on bargaining power status and QS flow (shaded text repeats previous tables; "-" = indicator or less power, "+" = indicator of more power, "o" = no change).

Indicators of Sector Power		Harvester (Supplier) Evaluation	Processor (Buyer) Evaluation
Threat of vertical integration is addressed in more detail the section above on vertical integration. Sector Concentration is addressed in more detail the above table on rivalry.			
Threat of vertically integrating with other sector	Status Quo	- Not much threat	+ Threat
	IFQ Program	+ Harvesters may vertically integrate by retaining ownership of fish while they are being processed (demanding custom processing services). + Harvesters may exert vertical influence by using QS to encourage new entry by processing concerns.	+ Increased incentive. - Threat limited by accumulation limits - Possible reduced vertical integration for firms with strong vertical integration.
	Initial QS Alloc	Financial resources for threatening vertical integration diminish.	Increased viability of vertical integration for firms not at QS accumulation limits.
Sector concentration	Status Quo	- More firms than processors. - Even distribution of market share	+ Relatively few. + High market share concentration
	IFQ Program	+ Increased concentration. + Reduction of potential for competition through activation of latent permits.	- Expanded geographic area of market. + Pressure for consolidation/integration - Consolidation/integration constrained by accumulation limits.

Indicators of Sector Power		Harvester (Supplier) Evaluation	Processor (Buyer) Evaluation
	Initial QS Alloc	*- Potential for activation of latent permits or capacity to service processor held QS increases number of possible participants*	*+ Processor held QP can be used to activate latent permits, decreasing harvester sector concentration. ? Effect on processors concentration is uncertain. More concentration if: larger firms expanding without the support of QS gain more profits than smaller firms expanding the same amount but with the support of QS; and a grandfather clause applies to the accumulation limits. The initial allocation will be an asset that may support consolidation.*
Switching Costs (buyer to a different supplier or supplier to a different buyer)	Status Quo	- No significant costs.	+ No significant costs.
	IFQ Program	o	o
	Initial QS Alloc	*o*	*o.*
Buyer customer power (customer willingness to boycott in support of supplier)	Status Quo	- No	N/A
	IFQ Program	o	N/A
	Initial QS Alloc	o	*N/A*
Suppliers' products are highly differentiated from one another	Status Quo	- No	+ No
	IFQ Program	o	o
	Initial QS Alloc	*o*	*o*

Barrier to Entry

Table 28. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) and QS flow.

Changes to Barriers to Entry		Harvesters	Processors
Government Regulation	Status Quo	Limited number of permits but some "latent". Heavily regulated.	Fishery management related regulations less heavy than for harvesters but also face environmental regulations (waste discharge).
	IFQ Program	+Increased fixed costs. +Absolute barrier to entry and expansion	o Minor increased fixed costs.
	Initial QS Alloc	The QS needed for participation will not be affected by who receives an initial allocation. Relative advantage for initial recipients is addressed under economies of scale.	Relative advantage for initial recipients is addressed under economies of scale.
Special Proprietary Knowledge	Status Quo	Fishing locations.	None identified.
	IFQ Program	o	o.
	Initial QS Alloc	o	o
Asset Specificity (Maleability)	Status Quo	Very specific (geographic relocation possible)	Very specific Shoreside--not mobile some utility in other sectors. At-sea--mobile
	IFQ Program	o	o
	Initial QS Alloc	o	o

Changes to Barriers to Entry		Harvesters	Processors
Economies of Scale	Status Quo	-	
	IFQ Program	+ The cost of achieving any given level of scale will be increased by the need to acquire QS.	+ If processors in the industry acquire QS, the cost to new entrants to reach a similar level of scale and efficiency will be increased by the need to purchase QS. Accumulation limits create absolute barrier in ability to protect higher production levels through ownership of IFQ.
	Initial QS Alloc	*The effect of the initial allocation on the barrier to entry for harvesters will not be as great as for processors.* *+Harvesters receiving an initial grant will have some short term financial advantage over new entrants in competition to acquire additional QS and achieve greater economies of scale. This advantage will be diminished as more of the initial allocation goes to processors but will also become more important as competition in the raw fish market increases with an increasing allocation to processors.* *o Those harvesters grandfathered in at greater levels of production may have greater profit opportunity than others, however, they will not be able to use those profits for the expansion of their harvesting operations. Therefore, it will not cause a competition barrier for new entrants.*	*+ If processors receive an initial allocation, over the short term the barrier to new entrants may increase because of the relative financial advantage provided by the grant of the asset.* *+ If some processors receive an initial allocation of QS, grandfathered in above the accumulation limits, those processors may have efficiencies of scale that provide them greater profits than would be available to new entrants or who could only achieve a similar level of production without the benefit of support of their own QS.*

Access to Capital

- Demand (time preference). The initial allocation will raise an individual's wealth level. If their income was relatively low, this may decrease their time preference, leading them to be willing to pay more for QS.

- Demand (risk). Those receiving an initial allocation of QS will have more secure access to their expected fishery related income. This may increase their willingness to incur additional debt in order to purchase more QS (giving them an advantage over those who do not receive QS).

- Demand (planning horizon and investment recovery). The initial allocation is not expected to have an effect on planning horizons or amount of investment a firm needs to recover.

Supply. Those receiving an initial allocation will experience an increase in wealth and be viewed as lower-risk borrowers than before they received the initial allocation. A lower risk profile will give them cheaper access to capital and enable them to more easily accumulate additional QS, up to accumulation limits. It will also put them in a better position to acquire capital for other improvements, which may lead to further business growth and additional QS purchases. Harvesters need access to QS/QP in order to produce. A harvester under economic stress that does not receive enough of an initial allocation for its business plan may find it difficult to acquire financing to purchase more QS and would therefore need to cease production or rely on QP provided by others to stay in business. Processors do not need direct access to quota share for processing activities; therefore QS/QP is not a key input. At the same time, processors with an initial allocation may be viewed as less risky, particularly if it appears that after IFQ program implementation harvesters may be in a position to exert market power. An initial allocation to crew would likely represent a substantial boost in their capital, increasing their ability to accrue additional capital, including QS. The funding base for communities is large enough that an initial allocation of QS is not likely to affect their access to capital.

Table 29. Influences of status quo, IFQ program and QS initial allocation on access to capital and QS flow.

		Harvesters	Processors	Crew	Communities
Demand for Capital					
Time Preference	SQ	Those with high time preference will not be willing to pay as much for QS.			
		Indication of high time preferences.	Uncertain	Low income may lead to high time preference.	Uncertain
	IFQ Program	No change.			
	Initial QS Alloc	*Increased wealth of initial recipients may increase their willingness to pay for QS.*			
Risk	Status Quo	Those who believe that the future holds greater risk than others believe will have a lower willingness to borrow.			
	IFQ Program	The fishery managed with IFQs will have inherently less risk. Personal assessment of future risk may change for those who acquire QS.			
	Initial QS Alloc	*Increased income security of those receiving an initial allocation of QS may increase their willingness to incur additional debt in order to purchase more QS.*			
Planning Horizon and Investment Recovery	Status Quo	Those who have a longer planning horizon for the use of an asset may be willing to pay more to acquire it (as compared to someone acquiring the same asset with a shorter horizon). (This outcome depends on there being a limited ability to recover investment through sale of the asset at the end of the planning horizon.)			
	IFQ Program	Those who have • a longer planning horizon or • need a longer time to recover a capital investment or have a larger capital investment (for which QS can help secure their return) will be willing to pay more for QS. No basis to distinguish among groups except that processors tend to have greater capital investments (VERIFY).			
	Initial QS Alloc	*The initial allocation is expected to have no effect.*			
Supply of Capital					
	Status Quo	The overall financial position of a firm will be evaluated in determining loan worthiness. Firms are likely to receive more favorable terms for a loan if they are larger, diversified, and have assets that may be used as security and are of value outside the industry.			
		Harvesters less likely to have capital useful in other industries. Of generally smaller total size than processors.	Firms more likely to have capital that may be useful in other industries. Firms often of larger size than harvesting firms.	Not likely to have fishing business related assets for use as collateral. This may mean higher costs of borrowing.	May have cheaper access if the governing body is viewed as lower risk.
	IFQ Program	In general, the IFQ program will likely decrease risk in the industry, reducing the cost of access to capital. QS are of tenuous value as collateral but important to the viability of a firms business plan. Firms with cheaper access to capital will be more likely to accumulate QS.			
		Risk may decrease with greater stability & possible increase in market power.	Processors may experience a risk increase associated with harvester mkt power, increasing capital costs.		
	Initial QS Alloc	*Initial recipients will experience increased wealth and be viewed as lower risk borrowers. Cheaper access to capital will spur their growth and lead to future QS purchases.*			
		QS/QP is needed for production. Firms under financial stress will be viewed as high risk and may find it difficult to acquire financing to purchase QS/QP..	*Access to QS/QP is not needed for processing activities. An allocation of QS may increase security of access to raw product, reducing risk and cost of capital.*	*An initial allocation would likely represent a substantial boost in the capital owned by crew members and increase their ability to accrue additional capital, including QS.*	*An initial allocation appears unlikely to change the communities standing the the capital market.*

● Impact on Conservation (Resource Stewardship Effect)

Resource stewardship is a term often used to describe actions that are taken to benefit the resource without respect to personal economic gain. It has been proposed that IFQ programs generate a "resource stewardship effect" as a result of privatization of the opportunity to harvest fish. We will look at four factors related to the degree to which an IFQ program might generate a resource stewardship effect and examine influence of the initial allocation on the likelihood that a resource stewardship effect is realized:

1. Degree of exclusivity of access
2. Discounted value for benefits that are in the future (i.e. delayed gratification)
3. Non-economic behavior
4. Control over of what happens on the vessel

♦ *Exclusivity*

Ownership of QS gives individuals a direct interest in the productivity of the resource, which cannot be impinged upon by others. However, it does not give them control or access to specific fish. Therefore, any action that a QS owner undertakes that either benefits or harms the resource is still shared proportionally with all other QS owners (NRC 1999, pg 36). Nevertheless, the approximation of sole ownership is greater under IFQs than under license limitation or open access management. Under these latter two systems, a fisherman is not even certain of receiving a share of the available harvest.

It may be that collective stewardship action is encouraged by IFQs and associated incentives, such as hard bycatch caps or area closures, more than individual action (e.g., fishermen's associations working to benefit the resource). For example, Nova Scotia fishermen worked with managers to develop stronger conservation measures, while at the same time there were anecdotal reports that individual actions for personal benefit continued, even though they adversely affected for the resource (highgrading and under-reporting catch) (NRC 1999)(, pg 106").[36] Collective actions (or collective restrictions) ensure that all participants are contributing to a particular outcome and that it is therefore more likely that the individual will receive a benefit commensurate with his or her contribution. Collective actions where the commitments are made up front will be most easily enforced (for example, an association of fishermen might invest in research to support a stock assessment). Other types of collective actions motivated by economic incentive require participants to trust one another to contribute to the collective good, resting on the belief that violators will be detected and penalized.

Sole ownership (i.e., exclusivity) may be a necessary condition for "stewardship" motivated solely by economic incentives; however, it does not guarantee a stewardship result. For example, economically driven stewardship may require that the returns available from harvesting all the fish and putting the net proceeds in the bank is less than the growth rate of the fish stock. This issue is addressed in the following section.

[36] Highgrading problems have appeared to have escalated in the Icelandic ITQ fishery where there is not full observer coverage. For other programs, such as those in New Zealand and the Alaskan halibut fishery, it is reported that under reporting of catch appears to be minimal. There are some questions as to whether or not there may have been problems in the Alaska sablefish fishery (NRC 1999). Highgrading also occurred in the Alaska red king crab fishery after rationalization.

DISCOUNT RATES

Whether or not someone is certain of gaining the return from their investment in stewardship, one must ask whether the return they will receive is enough to compensate them for waiting for that return. The term associated with this concept of "delayed gratification" is discount rates. Discount rates are discussed more fully above starting on page A-53. If the stock growth/improvement rate is greater than the individual's discount rate, then it will make sense for the individual to make an investment in anticipation of the greater return. If it is difficult for humans to take into account returns that take longer than a generation to be realized (e.g., longer than 30 years), or longer than the remaining span of their lifetime, then economically driven stewardship incentives for some of the slowest growing west coast rockfish species may be limited. Thus, if QS holder discount rates are high (see above section on discount rates) and resource condition improvement rates are slow, there may not be sufficient economic incentive for fishermen to make the investment that stewardship actions require.

♦ *Ethical Action*

Stewardship based on ethical action may occur even if the action does not make "economic sense" when we consider exclusivity and discount rates. There is much research showing that fairness and reciprocity are strong determinants of human behavior (Falk, *et al.* 2002) Under the models in this body of research, individuals value an outcome both for its effect on themselves and on others. Game theory experiments developed by Falk, et al. classified participants into those strongly motivated by reciprocity and those motivated primarily by personal economic gain. They observed that institutional rules determined the observed outcome, i.e., determined whether the outcome in the human system is driven by reciprocity or solely by economic self interest. If there is not an institutional rule that either externally forces cooperation or provides the possibility that participants will find ways to sanction one another, a non-cooperative outcome is more likely to result. Falk, et al. {Falk 2002) state "In a sense, institutions select the type of player that shapes the final result."

Falk, et al. {Falk 2002} also identify other theories for outcomes that are not solely economically driven, including "moral norm activation" (Stern, *et al.* 1999). Under this theory, if people accept a value (e.g., fishery conservation), believe that things important to that value are threatened (e.g., that excess harvest could damage the status and productivity of a stock), and that they can take actions which will help alleviate the threat, they will take those actions.

♦ *Control Over Activities on the Vessel*

If we assume that through economic or non-economic values there is a potential for sufficient incentive to encourage stewardship behavior, then the question is who is in the best position to control such behaviors. In this discussion we will assume that the QS holder has the greatest incentive for stewardship, due to combined economic and non-economic values. Dawson reviews the issue of control over production from the perspective of transaction costs associated with contract formation and contract enforcement (Dawson 2003). He identifies that specifying the exact behavioral deliverables in a contract, monitoring that behavior, and enforcing the contract become more difficult as the relational distance between the parties to the contract increases. For example, establishing standards, monitoring and control is much easier with an employee than with a contractor. Following this line of thought it appears that in terms of vessel operations the following would be a reasonable ranking of those with greatest control over stewardship behavior to those with the least such control.

- Crew members (most control if stewardship actions have to do with how individual fish are handled on deck)

- Vessel operator (most control for stewardship actions having to do with where the vessel fishes, length of tow, etc).
- Vessel owner/lessee (most control for stewardship actions having to do with gear and vessel equipment).
- Processor/permit owner
- Other entities that do not own QS

(Do we have data on owner/operator situation and permit/vessel owner, permit/vesselowner/operator frequencies, including the number of each with processor ownership involved)

On this basis, if the Council wants to place maximum emphasis on the likelihood that the IFQ program will lead to stewardship behavior (to the possible exclusion of other objectives), the program should be designed to encourage ownership consistent with the priorities in the above list. Moreover, the decision on which groups will be allowed or encouraged to own QS could be part of the design of an institutional framework that supports a stewardship ethic, as discussed in the section on ethical action (page A-71). This design may include consideration of the ability of QS holders to observe the actions of other QS holders and ability to impose sanctions. Those with the greatest ability to impose sanctions within a harvesting operation would be the owners of such operations. Those with the greatest ability to monitor the activities of other QS holders would be crew members (on a vessel where more than one of the participants owns QS). Crew members might also have the opportunity to impose sanctions, if the system is designed to provide QS owners with the opportunity to impose sanctions on other QS owners or if one of the "crew" members is also the vessel operator. However, crew self-monitoring and reporting would also involve challenges to the social relations of crew who work regularly with one another and live in close-knit communities.

♦ *Summary*

The initial allocation among groups is just that, an initial distribution. It does not determine where the QS will end up over time. However, those receiving an initial allocation will receive a leg up by the capital infusion represented by the allocations, and will be in a better position to maintain their QS and acquire additional QS in the future (except those who receive an allocation at or above their accumulation limits would not be able to acquire additional QS or QP). With respect to the potential stewardship effect, those present on the boat will be able to most effectively act on the stewardship incentive (i.e., be able to implement stewardship actions at the least cost). This is consistent with Clark's finding that fishermen who lease will have no incentive to conserve because they do not have long-term access (Francis, *et al.* 2007).

Table 30. Table: Summary of analysis of stewardship effect.

Exclusivity	QS owners have limited exclusivity because the benefit/cost of any action they take individually may be shared by all other QS owners. Yet there is more exclusivity than under open access or license limitation.
Discount Rates	Even if individuals have exclusivity, if they have a high discount rate, the increase in benefits over time may not be sufficient to compensate them for the near-term sacrifices. Fishermen have been reported to have relatively high discount rates.
Ethical Action	Ethical action may override (or act in concert with) action based solely on economic incentives. Therefore lack of complete exclusivity or discount rates higher than benefit return rates does not mean there will not be a stewardship effect. Institutional design can affect whether or not ethical considerations dominate behavior. Buy-in on the problem and potential for individual action to help alter the outcome can also be important.
Control	Crew members and vessel operators are in the best position (have the lowest cost) to monitor and control stewardship behavior.

● Impact on Sector Health

♦ *Buyers/Processors*

There is an overlap between buyers and processors in that some businesses act only as buyers, some buyers act as processors (buying only for themselves), and some buyers act as processors but also buy raw fish for other processors. The set of all businesses functioning as buyers is of concern because it is they who interact with harvesters in the raw fish market. Those buyers acting as processors are of concern here because of their larger capital investment in the fishery and the linkage of the level of investment to the management regulations (e.g., processor over-capitalization associated with a derby fishery). In Section A-2.1.1.d we will discuss whether the Council allocation to "processors" would be to actual processors or to buyers (as a proxy for processors), and the implications of that choice on the results of the analysis. In order to minimize confusion between the terms used in the analysis and those used in the alternatives (e.g. allocation to processors), in the following discussion we will use the term "processors" to refer to both buyers and processors, unless otherwise noted.

COMPETITIVENESS

There are two aspects of sector competitiveness to consider:
1. Competition in negotiations with harvesters
2. Competitiveness within the sector (smaller processors and large processors)
3. Competitiveness in wholesale markets

Negotiations with Harvesters. In the above sections on market power we focused on local competitiveness within the sector, focusing on the processing sector's interactions with harvesters in the raw fish market. There we found indicators that:
- That processors are in a strong position to exert market power under status quo (whether they do or not) and may have cheaper access to capital than harvesters,
- An IFQ program under which processors do not receive an initial allocation would weaken that position
- If even if weakened, processors could regain some strength through the acquisition of QS, but only up to accumulation limits (see Table 23 for a list of indicators of factors affecting the flow of QS among groups independent of the initial allocation)
- That an initial allocation of QS would give them a stronger negotiating position than if they do not receive an initial allocation

Specifically, an initial allocation of QS would:

1. Provide a capital infusion that may allow processors to employ one of a number of different strategies to grow and increase their efficiency (e.g., acquisition of additional QS, horizontal integration, etc.)
2. Diminish the exit barrier (liquidation of QS would allow a firm to exit the industry with less debt or greater gains)
3. Initially provide processors with greater bargaining power (as compared to their initial situation under IFQs if they did not receive an initial allocation)
4. Create a greater barrier to new entry
5. Create an even greater barrier to entry if there is an accumulation limit grandfather clause
6. Decrease the cost of processor access to capital

The initial capital infusion may have a long-term affect on the distribution of wealth in the industry. The effect of the IFQ program on processors' ability to remain in business is discussed below in the section on investments (page A-75).

Effect on Smaller Processors. If there is not an initial allocation to processors, smaller processors will be at a disadvantage relative to larger processors. At this time, most of the limited entry permits that are owned by processors are owned by larger processors. Therefore, smaller processors would have to acquire QS or negotiate with harvesters without that leverage. Either way, they would be at a competitive disadvantage within the sector. Anecdotal information has indicated that those processors in the IFQ system in British Columbia who did not own vessels or were not closely partnered with vessels had a financially difficult time competing while also having to make payments on their QS acquisitions. This is consistent with reports from New Zealand that indicate lower economic satisfaction for later entrants who have to buy QS to enter the fishery (as compared to those receiving an initial allocation) (Dewees 2006). An initial allocation of QS would give smaller processors some QS to work with, and if there is no accumulation limit grandfather clause, would substantially even the distribution of QS among processors. If there is an accumulation limit grandfather clause, it would probably still leave them at a significant disadvantage in QS holdings as compared to the larger processors. However, the larger processors may not be as effective in their use of QS as smaller processors.

Effect on Larger Processors. If there is an initial allocation to processors, larger processors will likely be at their accumulation limits (Table 44 and Table 48). If they are at their accumulation limits they would have no ability to extend their vertical integration (acquisition of harvesters) and if there is no grandfather clause they may have to reduce their level of vertical integration. Further consolidation of shares in their wholesale market would have to occur without the support of QS. Whether large processors are more likely than small processors to expand their market share would depend on the relative efficiencies of adding an increment of production to a large-scale processor without the support of QS as compared to adding the same increment of production to a small scale processor with the support of QS.

Competition in the Wholesale Market. One factor to be considered is how the IFQ program may affect the competitiveness of West coast seafood processors in the wholesale market. While West coast processors may participate and have an advantage in local niche markets, many of the fish products currently produced in the West coast groundfish fishery are sold into a wholesale market in which there is global competition. There are two concerns: (1) stability of supply and (2) price competition. The IFQ program may improve stability of supply (with some disruptions if harvesters are able to better-coordinate activities and tie up to get better prices). With respect to price competition, operational costs and raw product costs are the concerns.

In general, larger-scale operations gain efficiency (operate at lower per unit costs) up to a point where returns start to diminish. If the IFQ program results in West coast fish processing operations remaining smaller than might otherwise be optimal (due to the influences of accumulation limits on relative efficiency, as outlined in the previous two paragraphs), higher costs could make their products somewhat less competitive in the wholesale market. This would likely mean that raw fish prices (exvessel) might have to be somewhat lower in order for the product to clear the market. An initial allocation to processors and the accumulation limit grandfather clause would preserve the advantage of large processors until the accumulation limit grandfather clause expires. After the expiration of that clause, the likelihood that larger processing operations will continue to dominate the fishery will depend on the relative advantage that ownership of QS provides a processing operation. (QS ownership is not necessary for large operations but could improve their profits.)

Processors will be more likely to get raw product at a lower cost at the start of the program if they receive an initial allocation. If processors do not receive an initial allocation, the probability that harvesters will be able to exert market power in the short run increases. If raw product prices increase through harvester exercise of market power, West coast groundfish products could lose position in the wholesale market. If this occurs there will be self-correcting mechanism in which harvesters will be forced to drop their prices in order to have a market for their fish. However, if there is processor overcapitalization, as discussed in the next section, processors may bid away some of their profits that would otherwise have gone to return on capital investment. These effects are expected to be short-run effects because over time processors are eligible to buy QS and over the long run they are likely to accumulate QS to improve their bargaining power.

Investment, Dependence, and Disruption

Dependence on the groundfish trawl fishery is a function of the degree of investment in the fishery and the ability to employ the assets representing those investments in activities outside the groundfish trawl fishery. Thus, dependence on the trawl groundfish fishery implies that, absent an opportunity to earn income from the fishery, there would not be sufficient returns to compensate those making the original investment. The investments we will focus on in this section are primarily investments in physical capital, but there may also be investments in human capital (e.g., specialized knowledge or labor skills). The IFQ program will change the management system and markets, potentially disrupting a firm’s ability to recover returns on fishery dependent investments and affecting a firm’s ability to sustain participation in the industry. In this section we will assess the conditions and mechanisms under which a firms ability to recover returns on fishery-dependent investments and sustain participation will be adversely affected. We will also look at some qualitative indicators of the degree of that effect.

When the IFQ Program is implemented, those holding quota shares are expected to capture the difference between the maximum price for raw fish processors are willing to pay and the minimum price at which vessel owners are willing to harvest (the difference between P2 and P1 in Figure 3, resource rents). In question is whether QS holders might also capture a portion of the processor’s earnings needed to cover capital investments (their quasi rents).

Under status quo, if there is no processor overcapitalization, we would expect that the market would allow processors to cover their average total costs (i.e., earn enough to pay for their variable operating costs and earn a normal return for their fixed/capital costs). However, if there is more capital than is necessary to utilize the available raw product, some processors will produce at less than their optimal output, until the excess capital leaves the fishery. In section XXX we identify that the nonwhiting processing sector could be overcapitalized due to the recent contraction in the fishery and that the catcher vessel whiting sectors are overcapitalized due to their need to compete for vessel deliveries during the Olympic-style whiting seasons. Given an overcapitalized situation, processors will compete with one another to reach, as close as possible, their optimal level of output. In that competition, processors may bid away some of the profit that would otherwise go to return on their capital investment.

The following diagrams (Figure 8) illustrate the economic choices. Like Figure 1 through Figure 5, the diagrams show a price or dollar cost per unit on the vertical axis and a quantity on the horizontal axis. However, in Figure 1 through Figure 5 we were looking at demand and supply curves for the entire harvesting and entire processing sectors. Here we are looking at supply curves for a single firm. Three curves are shown in each figure, the top curve shows average total cost (including capital investments), the lower curve shows average variable costs and the curve crossing the other two shows marginal costs. The amount paid for raw fish adds in as an input that affects the height of the curves. As the price of raw fish increases all three curves move up. The difference between the left figure and the right figure is that the right-hand figure reflects a higher price for the raw product.

In order to achieve a normal profit, a firm must cover its variable and fixed costs (total costs). In the left-hand figure, a price of P1 for processed product would allow the firm to achieve a normal profit with the production of about 25 units. Twenty five units represents optimum capacity for this firm; however, if the industry is overcapitalized not all firms will be able to achieve optimum capacity. Assuming that wholesale prices are fixed (that the wholesale market is competitive), as a firm's production decreases it can be seen that it will no longer achieve normal profits (in the left-hand figure the revenue line, P1, is below the total cost line when production is less than 25 units). At around 5 units of production the firm would no longer cover variable costs and would cease production over the short term. Between 5 units and 25 units, the firm will continue to produce over the short run but over the long run it will not be able to replace capital as it wears out. Excess capacity in the sector means that some processors will face producing at levels at which they cannot cover total costs and will compete to reach as close to their optimal production levels as possible. In this example assume there are only 50 units of harvest available and five companies, each with a cost structure identical to that described here. Each company will strive to maintain as close to 25 units of production using whatever leverage it has available to acquire product. For example, a company might vertically integrate, link its willingness to accept deliveries to other products for which there is not a surplus in processing capacity, guarantee its ability to receive a vessel's product during an Olympic fishery, or it might offer higher exvessel prices. If a processor must attract product by raising the exvessel price it offers, the company raises its cost curves. A $15 per unit increase results in the cost curves shown on the right. If this increase is enough for the company to win 22+ units of production it will stay in business over the short term (i.e., cover its variable costs) but will not cover much if any of its fixed costs (i.e., its return on investment, quasi rents, will have been dissipated).

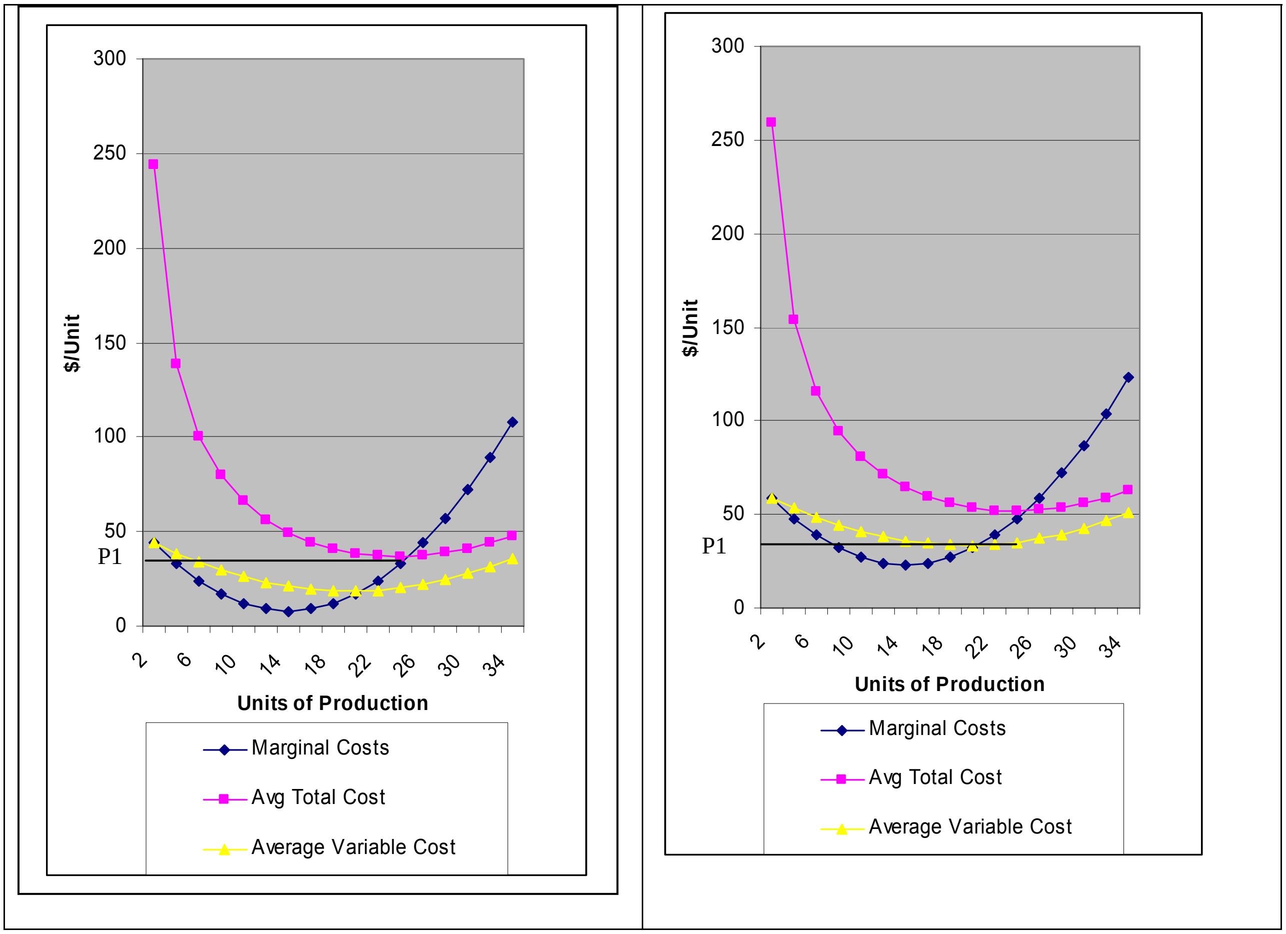

Figure 8. Comparison of cost curves before (left) and after (right) an increase in the cost of a key input.

If there is overcapitalization in the processing sector and the sector is fully competitive, processors will already have bid away some of their rents in the competition for the limited amount of raw product available. The IFQ program will reduce flexibility to turn to alternative harvesters, which might further increase the competition and hence price for raw product. These processors may find their situation somewhat improved if the IFQ program results in an increase in total landings (through bycatch avoidance), provides processors an opportunity to reduce costs (most likely in the whiting fishery), or provides processors an opportunity to seek higher wholesale prices. Even so, until excess capital is dissipated they will bid away any improvement as part of the competition for landings[37] and end up in a position similar to what they would be under status quo.[38] Capital will leave the fishery either as it wears out or as other markets are found for it. If a processor is covering its variable costs but can get a higher return on investment from liquidation of its capital assets than it can from continuing to produce, it may choose to do liquidate rather than remaining in the fishery.

If processors are overcapitalized but able to compete for deliveries at least partially through their ability to handle volume (i.e., not solely based on prices offered for raw product), then they may be earning some return on their capital investments that may be captured in bidding for raw fish after the transition to an IFQ program. This may be the situation in the catcher vessel whiting fishery.

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[37] Unless there are other means by which buyers ensure they have access to sufficient raw product.

[38] Since the nonwhiting fishery is already run at a slower pace, the opportunity for processing cost reduction or revenue increases may be relatively limited compared to the whiting fishery.

If the processing sector is not competitive (exerting market power) then so long as they are able to continue to exert market power after implementation of the IFQ Program QS holders will not be able to capture any of the processors' investment return related profits. If the processing becomes competitive after implementation of the IFQ program and it is overcapitalized, then it is possible that the QS holders will be able to capture some of the investment return related profits.

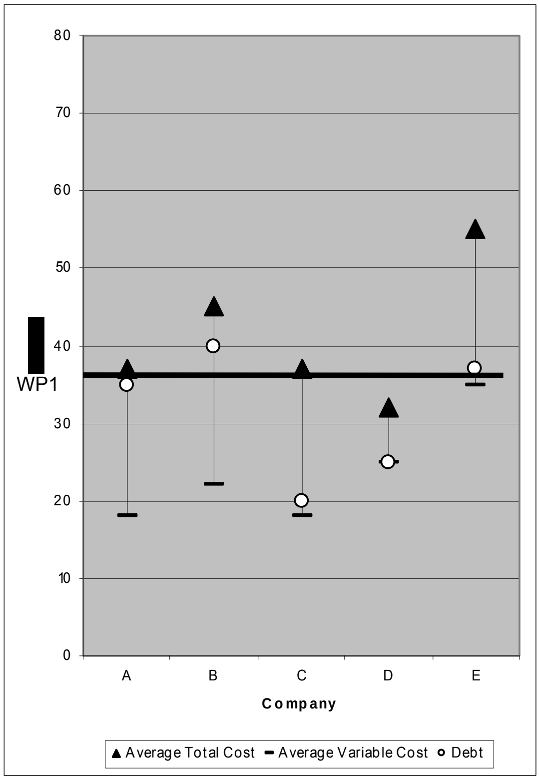
If the processing sector is not overcapitalized, the QS holders will not be able to capture investment related profits from the processing sector.

The following table provides a summary of the effects on processor return on investment as it varies by the degree of competitiveness in the sector under status quo.

Table 31. Effects on processor returns to investment resulting from the transition from status quo to an IFQ program.

	Processing Sector Competitiveness		
Processing Sector Capitalization	Noncompetitive (Market Power Exerted)	Fully Competitive (Price)	Fully Competitive (Capacity)
Fully Capitalized	Normal or above normal returns under status quo. QS holders will, at most, be able to capture resource rents (will not be able to capture processor profits that would go to return on investment).		
Overcapitalized	In a situation where market power is exerted overcapitalization would be most likely to arise as a result of historic conditions (e.g. a contraction in the available harvest). Processors would maintain their previous profit levels unless the sector becomes competitive after the IFQ program is implemented.	Under status quo, returns to capital dissipated. This continues under the IFQ program until no longer overcapitalized (unless the IFQ program allows processors to exert market power, i.e., transition to a less competitive situation)	Processors may be earning some returns to capital. Processors would no longer compete based on their capacity to handle product. If they then compete based on price offered for raw product, QS holders may be able to capture the profits associated with the processor assets (unless the IFQ program allows processors to exert market power, i.e., transition to a less competitive situation).

Note: market power in the harvester sector is not considered in this table. If that sector is able to exert market power, they would capture some of the rent that QS holders would otherwise capture. Fully competitive (capacity) means that processors compete for raw product at least partially on the basis of their ability to handle the volume rather than just price.



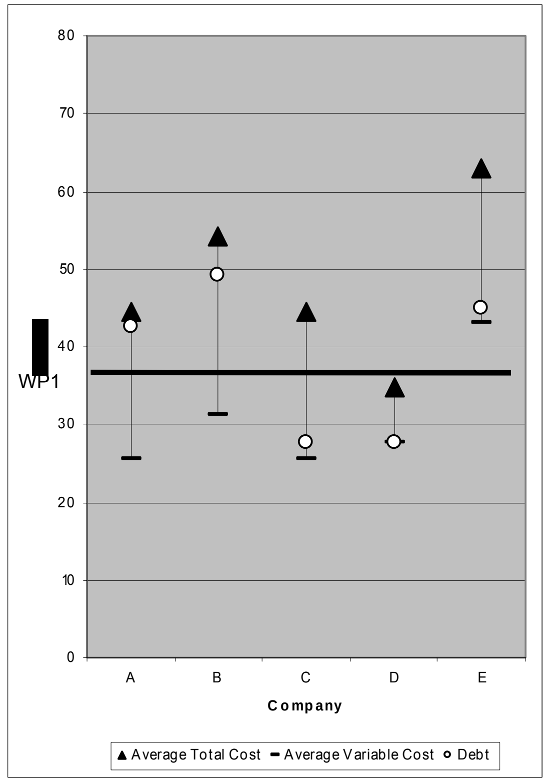


Figure 9. Hypothetical cost structures and debt positions for 5 firms at a set level of production. The right hand side figure assumes an increase in variable costs due to price competition for raw product deliveries.

In a situation where some profits that would otherwise go to capital might be lost as part of the competition for raw product under an IFQ program, it is important to consider the degree and duration of that loss. We do not necessarily expect that every firm will bid away all or even most of its returns to capital in the transition. Whether a particular firm is affected and the degree of impact depends on the cost structure and debt positions of other firms in the industry. In particular, the position of the weakest firms will have a significant bearing on the amount of profit that other firms dissipate in bidding for raw product to serve an overcapitalized industry. Firms with higher average variable costs and firms for which a significant portion of the difference between average total cost and average variable cost is dedicated to payments on a loan will have less flexibility to weather price competition. If these firms drop out quickly in the price competition there will not be so much of a need for remaining firms to bid away a portion of their profits. Some of the capacity within a firm may also "dropout" of production to the degree that it goes unused. Ultimately, the price that processors will bid for raw product will be just below the average variable costs of the most efficient of the excess units of capital. (The units of capital that are in excess are considered to be those that are less efficient. On this basis, the price paid will be slightly below the average costs of the most efficient of the capital units with lesser efficiency.) Each unit of capacity remaining active will be able to capture the profit that corresponds to the amount by which the efficiency of that unit exceeds the efficiency of the most efficient unit of capacity that drops out. A visual example of this concept is illustrated in the two diagrams in Figure 9 above. Five hypothetical firms are represented with different average total costs (top end of each bar), average variable costs (bottom end of each bar) and debt service (difference between the bottom of the bar and the block in the middle of each bar). With a price of wholesale price of P1 on the left hand side:

Firm A: Covers average total costs, average variable costs and makes payments on debt.

Firm B: Cannot cover average total costs but covers average variable costs (stays in business over the short run). Cannot make complete payments on debt.

Firm C: Covers average total costs, covers average variable costs, covers debt and has some cash flow representing additional returns to capital (difference between total costs and debt).
Firm D: Covers average total costs, average variable costs makes payments on debt and has some earnings above total costs (economic profit)
Firm E: Cannot cover average total costs but covers average variable costs (stays in business over the short run and makes payments on debt).

If these firms now compete for raw product by raising exvessel prices (figure on the right), firm E will drop out as soon as its average costs exceed P1. Firms A and B may also drop out if they cannot make arrangements for payments on their debt and Firm C will remain for the short run, collecting some returns on capital investment, but if raw product prices do not drop back down it will eventually have to exit as its capital wears out and needs to be replaced. Firm D remains, covering its total costs. This figure illustrates the dynamics that may occur if firms have dissimilar cost structures and debts. If instead all firms have similar cost structures and debt it would be more likely that production will be scaled back across the entire industry, with individual firms cutting out their least efficient units of production first. However, the same general rule would apply, with each unit of capacity remaining active capturing the profit that corresponds to the amount by which the efficiency of that unit exceeds the efficiency of the most efficient unit of capacity that drops out.

On this basis we can now consider reasons QS might be allocated to processors that relate to investment recover and industry stability.

Reduced Value of Processor Assets. Relative to status quo, processors are not expected to lose returns on their investment to QS holders unless there is overcapacity in the processing sector and competition for raw fish deliveries from harvesters has been based at least partially on something other than price (e.g., competition based on ability to handle volume). Where this is the case, processors will still earn an amount of return to capital that is related to the difference in efficiency between their capital and the most efficient units of capital that drop out of production. To the extent that returns on investment are diminished, diminishing the value of an asset, the allocation of QS to processors may provide them with an asset of value that may compensate them for the loss in value that they experience. That asset may also encourage more rapid rationalization of the processing sector by reducing the barrier to exit (making it easier for processors to recover capital losses).

SUMMARY

Allocation of QS to processors may:

- Strengthen their bargaining position *vis a vis* harvesters in the raw fish market (as compared to not receiving an allocation)
    - over the short run (via the initial grant of an asset and ability to hold QS in excess of accumulation limits)
    - over the long run, if they would not otherwise accumulate QS through purchase
- Possibly strengthen large producers relative to small producers (if there is a grandfather clause)
- Strengthen small producers relative to large producers (if there is no grandfather clause and depending on relative efficiencies)
- *Not likely* affect wholesale prices or competitiveness of west coast product in the wholesale markets.
- Under certain circumstances compensate for partial losses of returns on investment (i.e. if the sector is overcapitalized, fully competitive (market power is not being exerted), and at least some of the competition for raw product was on a basis other than price (e.g. the ability to handle a large volume of product in a timely manner)). It should be noted that in such circumstances the

processors were likely already losing some of their return on investment (to the degree that price was a factor in the competition for raw product). Also, the amount of profit that processors bid away in the price competition is unlikely to be the full amount that would otherwise go to return on investment.

- Reduce exit barriers by providing compensation for capital losses by those who might seek to leave the fishery.

♦ *Harvester Sector—Permits*

In this section we will focus on the permit owner and the permit as an asset independent of harvesting activities.

INVESTMENT DEPENDENCE AND DISRUPTION

Dependence on the groundfish trawl fishery is a function of the degree of investment in the fishery and ability to employ the assets representing those investments in activities outside the groundfish trawl fishery. This is described more fully in the corresponding section above on processors (page A-75).

Under an IFQ Program the limited entry permit values are expected to decline substantially because the fleet is expected to consolidate down to a number of vessels that is less than half the current number of permits (Section 4.x); because the permit by itself will not offer access to any amount of the groundfish trawl allocation; and because the permit has no alternative use (its value is entirely dependent on the access to groundfish that it allows). While these permits were issued to qualified vessel owners at relatively low cost (a cost sufficient to cover administrative costs of issuing the permits) up to 65% of these permits have changed ownership since the implementation of the license limitation program. Many of the exchanges are believed to have occurred at prices of several hundreds of thousands of dollars. Therefore, there are many owners who have made a substantial financial investment in the permits.

Table 32 Estimated Permit values in March 2004 (Based on Dockstreet Broker Report on $/point).

			Permit Values Based on	
Permit Endorsement	Length	Points	$6,000/point	$10,000/point
40 feet		6	$36,000	$60,000
50 feet		10	$60,000	$100,000
60 feet		16	$96,000	$150,000
70 feet		23	$138,000	$230,000
80 feet		32	$192,000	$320,000
90 feet		43	$258,000	$430,000
100 feet		56	$336,000	$560,000

All of those who hold the permits, regardless of whether they purchased them or received them as part of the initial allocation, will experience a decrease in the value of that asset. Under status quo all permits of a similar size class are of similar value in terms of the access they provide to the fishery (note: in the current climate permits with similar size endorsements may trade at values related to their catch history, because of speculation that QS will be given to permit owners). How a particular permit owner fares as a result of the IFQ program will depend on the amount of QS given to permit holders in aggregate, the formula for allocating among permits, and the amount of catch history associated with that particular owners permit. In Section 4.x.x. it was estimated that annual resource rents for the nonwhiting fishery (the value of the QP) might run about $18 million per year (after subtracting $350/day for observer costs). QS have been reported to trade for between 3.5 and 10 times the QP price. Therefore, the QS value would be expected to run between $63 million and $180 million. There are up to 163 permits that may qualify for nonwhiting sector QS. Therefore, on average these permit holders would receive between about $0.5 million and $1.5 million of QS per permit.

Table 33. Estimated value of nonwhiting QS to be issued.

	3.5:1 QS:QP Ratio	10:1 QS:QP Ratio
Annual Value of Non-whiting QP	$18,000,000	$18,000,000
Estimated Value of QS	$63,000,000	$180,000,000
Average QS per Permit	$508,000	$1,452,000

Note: A ratio of 3.5:1 has the same result as a discount rate of about 10.5 percent applied over 30 years. A ratio of 10:1 has the same result as a discount rate of about 40 percent applied over 30 years.

However, the owner of a permit which has relatively low catch history may experience a decrease in the value of their combined permit/QS assets (as compared to value of the permit before adding speculation about the IFQ program effects), even if 100 percent of the QS is given to permit holders. For purposes of illustration, assume an average permit price of $200,000. With a 100 percent allocation to permits and QS valued at $180 million, there are 38 permits that will receive some QS but less than $200,000 worth (22 percent of the 163 permits that will receive some nonwhiting QS) (Table 34).[39] On the other hand, if only 75 percent of the QS goes to permits and the QS is valued at $63 million, then 69 of 163 permits receiving some catch history would receive less than $200,000 of QS (42 percent of the permits that will receive some catch history) (Table 35). The following tables provide a number of comparison points for considering how many permit owners might have their asset values reduced depending on the assumed value that permits would have under the license program.

These data do not take into account the value of some of these permits in the whiting fishery. We do not have estimates available for the expected value of whiting QS. However, Table 37 and Table 38 provide the estimated exvessel value that might be taken with QP issued for the shoreside whiting and at-sea whiting fisheries..

[39] The calculation is based on applying the vessels share of all nonwhiting QS to the estimated value of the nonwhiting QS.

Table 34 Estimated QS value per permit, based on permit catch history, assuming an aggregate QS value of **$180 million**.

QS Value Per Permit	# Permits	% of Permits	% of QS Value
100% Allocation to Permits, No Equal Sharing of Buyback History			
0	6	3.6%	0.0%
1-1,000	6	3.6%	0.0%
1,000 - 50,000	13	7.7%	0.1%
50,000 - 100,000	7	4.1%	0.3%
100,000 - 200,000	6	3.6%	0.5%
200,000 - 500,000	16	9.5%	2.8%
500,000 - 1,000,000	28	16.6%	12.2%
> 1,000,000	64	37.9%	52.1%
> 2 million 2,000,000	23	13.6%	31.9%
TOTAL	169	100.0%	100.0%
Total >0	163	96.4%	100.0%
75% Allocation to Permits, No Equal Sharing of Buyback History			
0	6	3.6%	0.0%
1-1,000	7	4.1%	0.0%
1,000 - 50,000	13	7.7%	0.1%
50,000 - 100,000	8	4.7%	0.3%
100,000 - 200,000	10	5.9%	0.8%
200,000 - 500,000	14	8.3%	2.5%
500,000 - 1,000,000	48	28.4%	20.0%
1,000,000 – 2,000,000	57	33.7%	43.7%
> 2 million	6	3.6%	7.5.%
TOTAL	169	100.0%	75.0%
Total >0	163	96.4%	75.0%

Table 35 Estimated QS value per permit, based on permit catch history, assuming an aggregate QS value of **$63 million**.

QS Value Per Permit	# Permits	% of Permits	% of QS Value
100% Allocation to Permits, No Equal Sharing of Buyback History			
0	6	3.6%	0.0%
1-1,000	9	5.3%	0.0%
1,000 - 50,000	19	11.2%	0.6%
50,000 - 100,000	11	6.5%	1.3%
100,000 - 200,000	11	6.5%	2.5%
200,000 - 500,000	55	32.5%	31.1%
500,000 - 1,000,000	53	31.4%	56.1%
> 1,000,000	5	3.0%	8.5%
Total:	169	100.0%	100.0%
Total >0:	163	96.4%	100.0%
75% Allocation to Permits, No Equal Sharing of Buyback History			
0	6	3.6%	0.0%
1-1,000	9	5.3%	0.0%
1,000 - 50,000	23	13.6%	0.7%
50,000 - 100,000	12	7.1%	1.4%
100,000 - 200,000	19	11.2%	4.9%
200,000 - 500,000	73	43.2%	40.8%
500,000 - 1,000,000	27	16.0%	27.2%
> 1,000,000	0	0.0%	0.0%
Total:	169	100.0%	75.0%
Total >0:	163	96.4%	75.0%

Table 36 Estimated QS value per permit, based on permit catch history, assuming an aggregate QS value of **$180 million and $63 million**.. 100% Allocation to Permits and Equal Sharing of Buyback History

QS Value Per Permit	# Permits	% of Permits	% of QS Value
QS Value of $180 million.			
0	0	0.0%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	0	0.0%	0.0%
50,000 - 100,000	0	0.0%	0.0%
100,000 - 200,000	0	0.0%	0.0%
200,000 - 500,000	19	11.2%	5.2%
500,000 - 1,000,000	58	34.3%	23.0%
1,000,000 – 2,000,000	88	52.1%	67.1%
> 2,000,000	4	2.4%	4.8%
TOTAL	169	100.0%	100.0%
QS Value of $63 million.			
0	0	0.0%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	0	0.0%	0.0%
50,000 - 100,000	0	0.0%	0.0%
100,000 - 200,000	36	21.3%	10.2%
200,000 - 500,000	98	58.0%	56.4%
500,000 - 1,000,000	35	20.7%	33.5%
> 1,000,000	0	0.0%	0.0%
TOTAL	169	100.0%	100.0%

Table 37. Estimated exvessel value of **shoreside whiting** per permit, based on QP issued for permit catch history (does not take into account net profits or expected time stream of future revenue that would be reflected in QS value) (total QP value is $13.7 million)

Exvessel Value Per Permit	# Permits	% of Permits	% of QS Value
100% Allocation to Permits, No Equal Sharing of Buyback History			
0	110	65.1%	0.0%
1-1,000	8	4.7%	0.0%
1,000 - 50,000	11	6.5%	1.4%
50,000 - 100,000	5	3.0%	3.2%
100,000 - 200,000	7	4.1%	7.5%
200,000 - 500,000	16	9.5%	36.5%
500,000 - 1,000,000	12	7.1%	51.4%
> 1,000,000	0	0.0%	0.0%
169	100.0%	100.0%	100.0%
59	34.9%	100.0%	100.0%
50% Allocation to Permits, No Equal Sharing of Buyback History			
0	110	65.1%	0.0%
1-1,000	11	6.5%	0.0%
1,000 - 50,000	13	7.7%	2.2%
50,000 - 100,000	7	4.1%	3.8%
100,000 - 200,000	14	8.3%	15.1%
200,000 - 500,000	14	8.3%	28.9%
500,000 - 1,000,000	0	0.0%	0.0%
> 1,000,000	0	0.0%	0.0%
169	100.0%	50.0%	75.0%
59	34.9%	50.0%	75.0%

Table 38 Estimated exvessel value of **mothership whiting** per permit, based on QP issued for permit catch history (does not take into account net profits or expected time stream of future revenue that would be reflected in QS value) (total QP value is $6.9 million)

Exvessel Value Per Permit	# Permits	% of Permits	% of QS Value
100% Allocation to Permits, No Equal Sharing of Buyback History			
0	137	81.1%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	4	2.4%	1.1%
50,000 - 100,000	6	3.6%	6.6%
100,000 - 200,000	6	3.6%	14.2%
200,000 - 500,000	15	8.9%	67.9%
500,000 - 1,000,000	1	0.6%	10.2%
> 1,000,000	0	0.0%	0.0%
169	100.0%	100.0%	100.0%
32	18.9%	100.0%	100.0%
50% Allocation to Permits, No Equal Sharing of Buyback History			
0	137	81.1%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	10	5.9%	3.9%
50,000 - 100,000	6	3.6%	7.1%
100,000 - 200,000	15	8.9%	33.9%
200,000 - 500,000	1	0.6%	5.1%
500,000 - 1,000,000	0	0.0%	0.0%
> 1,000,000	0	0.0%	0.0%

169	100.0%	50.0%	75.0%
32	18.9%	50.0%	75.0%

SUMMARY

- Limited entry permits are highly specific assets, and their value the value of which is likely to decline substantially with the implementation of an IFQ program.
- Owners of permits without much history may experience a decline in the value of their permits.
- At most 65% of the permits have changed ownership since the implementation of the program. The remainder of the permits continue to be owned by entities that received them as part of an initial grant.

♦ *Harvest Sector Vessels*

We will focus on vessels as the main unit around which the harvesting operation is organized. The permit owner and the vessel owner are believed to be the same about 88 percent of the time (based on a matching of permit owner and vessel owner addresses).

Table 39. Indications of vessels leasing permits.

	Name of Vessel Owner and Permit Holder	Address of Vessel Owner and Permit Holder
Same	136 Permits (76%)	155 Permits (87%)
Different	42 Permits (0.24%)	23 Permits (0.13%)
Total	178 Permits	178 Permits

Anecdotal information indicates that in some cases where a vessel owner and permit owner information do not match, the permit is being purchased by the vessel owner and transfer is scheduled to be completed when the final payment is made.

COMPETITIVENESS

Negotiations with Processors. In the above sections on market power we focused on competitiveness within the sector, focusing on the harvesting sector’s interactions with processors in the raw fish market. There we found indicators that:

- Harvesters are in a weaker position than processors to exert market power under status quo
- Access to capital may be more expensive for harvesters than processors
- Over the short term there are more reasons to expect that harvesters will gain more efficiency under an IFQ program than processors (over the long-term both sectors will rationalize)
- If harvesters receive all the QS at the time of initial allocation their bargaining position will be significantly strengthened; competition among harvesters will be isolated to the QS/QP market, to the extent that processors do not acquire QS over time, and there will be incentive for harvesters to cooperate in the raw fish market.
- Harvesters could regain some strength through the acquisition of QS they do not receive, but only up to accumulation limits (see Table 2 for a list of indicators of factors affecting the flow of QS among groups independent of the initial allocation)

Specifically, as the allocation of QS to processors increases

- The capital infusion to harvesters decreases
- The exit barriers increase lengthening the IFQ program transition period

- Harvester competition in the raw fish market will increase reducing their bargaining power
- The cost of harvester access to capital would increase
- The likelihood of harvester bankruptcies would increase

The initial capital infusion may have a long-term effect on the distribution of wealth in the industry.

Competition Within the Sector. The largest harvesters will receive amounts of QS that exceed accumulation limits, assuming there is a grandfather clause (information is provided on amounts that will be allocated to permit, relative to accumulation limits, and under different permit/processor splits is provided in Table 50 through Table 54). Over time, as the grandfather clause expires, the scale of the largest producers will be diminished. If processors are given an initial allocation, the amount of QS held by harvesters in excess of accumulation limits when the program starts out will be lower, resulting in more immediate disruption (see following section). If vessels receive a 100% allocation, there will be more harvesters receiving more QS in excess of accumulation limits. These harvesters will be able to operate at lower costs than new entrants and those below accumulation limits. However, this opportunity for higher profits will not be of value to them in accumulating more QS/QP (because of accumulation limits). It is also unlikely that they would have reason to try to undercut the raw fish delivery prices offered by harvesters operating at smaller less efficient scales. Those vessels that have the advantage of receiving QS as part of the initial allocation will be better able to compete for processor held QP in the raw fish market than new entrants.

INVESTMENT DEPENDENCE AND DISRUPTION

Dependence on the groundfish trawl fishery is a function of the degree of investment in the fishery and ability to employ the assets representing those investments in activities outside the groundfish trawl fishery. This is described more fully in the corresponding section above on processors (page A-75). The situations of vessels *vis a vis* QS holders is similar to the situation of processors, i.e., to the degree that there is overcapitalization and price competition vessel owners will likely give up some (not all) of their return on capital, by way of accepting lower prices for raw fish or paying more for QP (until the point is reached at which there is no longer surplus capacity in the fishery). If harvesters give up returns on capital to QP holders, it is not expected that the amount given up will be substantially greater under IFQs than under status quo.

The illustration provided above for processors (Figure 8 and Figure 9) can also be applied to harvesting operations in the nonwhiting and whiting fishery. The difference is that rather than bidding up the price of raw fish the harvesters will increase their costs by bidding up the price of a different key input, the QP. A similar dynamic will ensue in which under an IFQ program there will be opportunities for harvesters to reduce costs as compared to status quo management, and relative cost structures and debt positions will determine how much of the potential profits are bid away to QP owners. The process by which vessels increase their economic efficiency as QS is consolidated and transferred from less efficient to more efficient producers and as less efficient vessels leave the fishery is described in Section 4.x.x. Using Figure 8 but applying it to vessels, if processors were offering a price for raw fish of P1, vessels would try to expand their production to 25 units. However, increased competition and the eventual contraction in the allowable harvest would leave them operating to the left of their optimal point. As with processors, for vessel owners the effect of the imposition of the IFQ program on returns to capital will depend on the degree to which those returns are already dissipated and the cost structure and debt positions of all firms in the sector. However, the new flexibility provided by the IFQ program may afford harvesters with more opportunity/necessity than processors to rapidly modify their operations, decreasing their total and average costs, particularly as compared to nonwhiting processors. If excess capacity leaves the harvesting sector more rapidly (the sector becomes rationalized) the period of time over which returns on investment are dissipated in bidding for QS could be shorter as compared to that for processors.

Harvesters must acquire QS or QP in order to harvest. The more of the QS that is given to harvesters as part of the initial allocation, the less they will continue to dissipate their returns on investment in bidding for a market for their raw fish or QS/QP. If 100 percent of the QS is given to permit holders, the need for harvesters to dissipate their profits related to capital investment in bidding for QS would depend on whether they own a permit for their vessel and how the initial allocation matches up with their existing and optimal production levels. DEVELOP AND REFERENCE FIGURES COMPARING PERMIT QS VAL TO VAL OF 2004-2006 LANDINGS. As the amount given to processors increases a harvester's need to acquire QS or access to QP increases. Vessel owners that are not permit owners (i.e., do not receive an initial allocation of QS) will be in a particularly difficult position with respect acquiring QS in terms of both their need and their ability to borrow money for QS acquisition. However, they will essentially be in the same position as a new entrant (Francis, *et al.* 2007) (except they will have already made substantial capital investments and have some expertise in the fishery). For harvesters already under some financial stress (in particular those which do not have much equity in their capital assets), the need to acquire QS or access to QP combined with limited assets to provide as collateral for QS purchase will put them at a greater risk for bankruptcy or exiting the fishery as compared to a processor in a similar financial situation that does not receive QS. This risk and the harvesters leaving the fishery is part of the rationalization process. To the degree that harvesters do not receive the QS they need for their operations, their may be more firms may leave the fishery rapidly when the program is first implemented.

The firm's economic condition will be strongly affected depending on what it has to pay for the QS and the firm's status with respect to recovery of initial capital investments (Table 33). The relative position of firms receiving QS *vis a vis* those not receiving an initial allocation will also be affected by the price of QS and whether or not the firm has recovered their previous capital investments or is still making payments. As will be discussed in more detail in the section on impacts, if the fishery is overcapitalized, the price of the QS may include some profits that would otherwise have gone to returns for capital investments. Thus, a firm may receive the QS free as part of an initial allocation, may need to purchase QS that represents the rent to the resource, or may have to pay a higher QS price (one that represents rent to the resource and some additional amount associated with the degree of overcapitalization in the fishery). The firm may come into this situation from one of two positions with respect to its capital investment, either at a time when it has fully recovered the cost of the capital investment (having repaid any loans taken to make the investment) or at a time when it is still making payments on the original investment.

Table 40. Firm's economic status with respect to capital investment depending on QS price (rows) and whether or not it is still making payments on existing capital investments (columns).

	Status of Capital Investment	
QS Acquisition	Recovered Capital Investment	Still Paying for Capital Investment
Free Endowment as Part of Initial Allocation	Excellent position for growth and competition. Endowment plus cash flow associated with already depreciated capital, plus greater efficiency.	Increased ability to pay for capital with better efficiency under IFQs.
Purchase: QS Price Represents Resource Rent	Should be able to recover QS cost through profits, plus have some additional cash flow associated with already depreciated capital.	Should be able to recover QS cost through profits.
Purchase: QS Price Represents Resource Rents and Some Profits That Would Otherwise Go to Returns to Capital Investment	Should be able to recover QS cost through profits and give up some of the bonus cash flow from already depreciated capital.	May need to exit fishery if the increase profits are not enough to compensate for the cost of the QS and make payments on capital investment.

SUMMARY

Allocation of QS to harvesters may:

- Strengthen their bargaining position *vis a vis* processors in the raw fish market (as compared to status quo and as compared to IFQs in which harvesters receive a lesser allocation)
    - over the short run (via the initial grant of an asset and ability to hold QS in excess of accumulation limits), and
    - over the long run, if they would not otherwise accumulate QS through purchase
- Reduce disruption that might result from the immediate downscaling of harvesting operations that are in excess of grandfather clauses (including harvesting operations controlled by processors). Greater immediate disruption results if harvesters do not receive 100% allocation or there is not grandfather clause.
- Reduce disruption that might result from the immediate departure of firms that receive substantially less than what they need to stay in business and, that are unable to finance additional purchases.
- Reduce exit barriers by providing compensation for capital losses by those who seek to leave the fishery.
- Provide harvesters security of an asset that can be used to demonstrate that they have a viable business model when seeking financing for further capital investment (there are indicators under status quo that harvesters are in a weaker position than shoreside processors to acquire access to capital).

♦ *Labor—Harvester*

It is reported that under IFQ programs, labor compensation sometimes changes from a share of the profits to an hourly or wage basis. An initial allocation of QS to crew members would not necessarily prevent that shift from occurring, but would provide crew members with some record of participation an opportunity to maintain a share of the harvesting profits. This form of compensation would provide them an award in perpetuity (for duration of the IFQ program or for as long as they decide to hold the QS, regardless of whether or not they continue to work as a crew member).

As with physical assets, labor also earns a return that will be affected by the creation of an IFQ program. Crew members who earn above-average shares because of their development of particular skills may lose the advantage of those skills if they are forced to move into another occupation. However, humans are more malleable than physical capital in terms of their ability to take on different tasks. Allocation of QS to crew members was discussed but rejected because of the difficulty of identifying eligible crew members and consequently the likely costs that would be associated with such an allocation. The program was designed to facilitate crew member purchase of QS, by specifying that QS be highly divisible and that anyone can acquire shares who is eligible to own a US documented fishing.

The balance of the allocation of QS among harvesters and processors will affect harvester labor through the: speed of adjustment required , geographic distribution of harvest operations, and distribution of activity among vessels.

The following discussion summarizes the findings of Section 4.4.2 on the impacts of the IFQ program on crew members. In the harvesting sector, the number of crew and captain jobs is expected to decline but more of the jobs are expected to be full time. Additionally, crew shares may decline but that decline, may be offset by an overall increase in vessel earnings such that total earnings per crew member increases. The nature of compensation may also change. Traditionally, crew members have taken part in the risk and reward of the harvest operations by taking their income as a share of the vessel revenue, and the share earned by a crew member varies with their skill level. Under IFQs there is sometimes a change from share-based compensation to wage-based compensation.

The main source of new entrants to the fishery is captains and crew members. The IFQ program will make it more expensive to enter the fishery, but will provide a more stable industry, thereby reducing risk. During Council deliberations on the effect of the program on crew members, it has been noted that new entry by crew members will be facilitated by the liberal eligibility requirements for owning QS (A-2.2.3.a) and the high degree of QS divisibility, which allows for crew members to incrementally acquire capital and speed their accumulation of wealth.

As described for harvesters, as the allocation to processors increases, the speed of rationalization in the fishery is likely to increase. More rapid rationalization of capital will require a more rapid adjustment by labor. In addition to the duration and timing of jobs, locations and vessels on which there are opportunities to harvest will be affected. Over time, QS is expected to flow to ports that are able to support the most efficient complex of harvesting and processing operations, taking into account both travel costs to and from the fishing grounds and to distribution centers for wholesale products. However, due to transaction costs and other ways in which the economic system does not function in the ideal, the initial distribution will likely affect the geographic distribution of activities (and hence employment opportunities) in both the short and long term. The more of the QS that goes to processors, the more the location of harvest/landing activity will be initially directed by factors related to processing operation costs; and the more likely it is that jobs will be on processor owned vessels as opposed to vessels of independent harvesters.

SUMMARY

1. Crew members have specialized skills that may not be transferable to other sectors.
2. The number of jobs is expected to decline as is the nature of compensation.
3. While crew members are impacted they are not being considered for an allocation QS due to the high cost of conducting such an allocation, human capital is more malleable than physical capital and other features of the program facilitate incremental acquisition of QS by crew members.
4. As allocation to processors increases, the speed of rationalization in the harvesting sector is likely to increase requiring more rapid adjustment by crew members.
5. Geographic distribution is likely to be affected by the initial allocation and the more allocated to processors the more harvest/landing activities will be initially directed by factors relating to processing operations preferences and the more likely that jobs will be on processor-owned vessels as opposed to independent harvesting vessels.

♦ *Labor—Processor*

The main effect of the initial allocation of QS to processors is likely to be the geographic distribution of processing jobs. The types and numbers of jobs may also be affected by the relative size of the processing operations in the industry. The effect on size of processor operations is discussed in the section above on allocation to the processor sector. The effects on labor are discussed in Section 4.x.x on processor labor.

● Impact on Net Benefits

The impacts considered in this section are closely related to the overall economic efficiency outcome (i.e., net benefits or social welfare).

We will look the impact of the initial allocation of QS among groups on net benefits as it is affected by:

- competitiveness in markets
- transaction costs
- implementation costs

♦ *Noncompetitive Market*

A noncompetitive market (one in which one side or the other is able to influence price away from the competitive equilibrium, i.e., exerts market power) generally has two effects on economic welfare: (1) it redistributes income toward the side of the market with market power and (2) it reduces overall production in the economy. In the section on the effects of market power on flow of QS (page A-62) and sector health (page A-73) we have discussed the distributive effects extensively. The results of the effects of the allocation on market power and QS flow are summarized very generally as follows:

- Under status quo there are more indicators that processors may be able to exert market power than harvesters.
- The creation of an IFQ program will likely increase to some degree the potential for harvesters to exert market power or resist processor market power, independent of the amount of QS they are initially granted.
- Whoever receives an initial allocation of QS is likely to be in a better position to exert market power and accumulate additional QS.

Here our concern is the effect of market power on overall net benefits. The effect on net benefits on production is less clear than under classical economic theory because production is constrained by government regulation of a key input (the amount of fish produced). Based on current production levels and demand, the fact that it costs nothing for a QS holder to produce QP (release onto the market additional QP) it does not appear likely that if one side or the other is able to control market prices that total annual production will be affected. The main effect is likely to be distributional and reflected in the price paid for QS/QP.[40] Exerting monopoly like control over prices in a QP market has some particular challenges. First, if a dominant QS holder releases QP in a manner that reduces fleet efficiency, the amount individuals would be willing to pay for QP would be reduced by the reduction in efficiency. Second, QP are nonperishable and highly liquid, any QP released reduces the QS holder’s market power. Third, the production of QP is almost zero cost and any QP not release to a vessel by the end of the year expires. Fourth, the only rents available through the exertion of market power are those that would otherwise go to the QP holder, unless either profits are captured that would otherwise go to return on investment or the dominant QS holder is able to achieve price discrimination (charge each potential buyer the maximum it is willing to pay rather than a market price based on the release of a reduced quantity of QS (the more typical way a monopolist would extract additional rents).

♦ *Transaction Costs*

In order for QS to be used, the QP issued to the QS holders will need to be transferred to a vessel account. Transaction costs are those costs associated with the search for an input, the bidding and negotiation process, monitoring performance on the transaction contract, and transaction contract enforcement. The greater the distance in ownership between the QS holder and the vessel and the more dispersed the ownership of the QS, the greater will be the transaction costs. The entity most certainly connected with the vessel is the vessel owner. Allocations to vessel owners are not being considered. The next entity

[40] NEEDS FURTHER THOUGHT: NMFS guidelines on LAPPs suggest that excessive control of QS might result in an individual operating as a monopsonist or monopolist in the QS market and that this would lead to a less efficient fleet (NMFS 2007).

that is most probably linked to the ownership of a particular vessel is the permit owner (87 percent of the permits appear to be owned by the vessel owner). Crew members are also associated with vessels but are probably more mobile between vessels and there are more crew members than vessels, therefore there would be more transactions to negotiate. Processors also have close connections to vessels (7 percent of permits and XX percent of vessels are believed to be owned by processors). An allocation to processors would require fewer transactions, and likely lower transaction costs, than an allocation to crew members.

Another factor affecting transaction costs is how the QS are distributed as compared to the recent distribution of catch among fishery participants. The greater the difference the more transactions required to get the QS/QP into the hands of those who need it to continue their operations. If these transactions do not occur then higher costs will emerge as dislocation costs since those who have been recently catching the fish will no longer be able to do so and those receiving the QS may ramp up to higher levels of production than they have experienced in the recent past. In the section below on equity a quantitative assessment is provided of the difference between the distribution of QS among participants and the recent participation history of those participants (Current and Historic Harvests on page A-97).

♦ *Administrative Costs*

Each group to which an initial allocation is given will add to the administrative start-up costs of the program. The least expensive way to make an initial allocation would likely be through an auction that is open to all comers; however, such an option is not among those that have been identified for full analysis. Permit owners are a defined group and therefore an allocation or auction to permit holders would likely be relatively in expensive, as compared to an allocation to crew members. While an allocation to crew members is not impossible, it would be difficult because crew licensing varies by state and data are not kept on the crew members working on each boat. Such an approach could require the development of complex rules for evaluating crew member qualifications or simple rules that either do not allocate to the intended crew members or allocate to substantially more people than the intended crew members. In either case, the costs of the initial allocation would increase substantially. An allocation to crew members is not being considered at this time. The other group for which the Council is considering an allocation is processors. The costs of allocating to processors will depend on the rules developed for the allocation. Information about buyers is included on every fish ticket while there is not information on the ticket about whether the buyer (1) is a processor and (2) processed the fish. The Council's intent is to allocate to processors, but an allocation to buyers is being considered as a lower-cost proxy for the allocation to processors. This is discussed in more detail in section A-2.1.1.d. The administrative costs of the initial allocation will somewhat affect total net benefits, particularly at the start of the program, but the start-up costs will likely have negligible effects on net program benefits over the long run.

Who bears the costs is independent of the effect on net benefits but needs to be identified. Direct costs of the initial allocation will be covered by fees collected from the applicants.

SUMMARY

- The initial distribution of QS affect each sector's ability to exert market power. If one sector is able to exert market power it may adversely affect efficiency, and hence net benefits, though this issue needs further exploration. The results of the effects of allocation on market power and QS flow are summarized very generally as follows:
  - Under status quo there are more indicators that processors may be able to exert market power than there are such indicators for harvesters.

  - An IFQ program will likely cause at least some increase the potential for harvesters to exert market power or resist processor market power, independent of the amount of QS they are initially granted.
  - Whoever receives an initial allocation of QS is likely to be in a better position to exert market power and accumulate additional QS.
- As the amount of QS issued to processors increases, transaction costs will increase as QP issued to processors will have to transferred to vessels each year in order to be used.
- As the amount of QS issued to processors increases, there is a greater mismatch between recent production by processors-permit associations and the QS distribution to those processor-permit associations (Figure 10)
- Program administrative costs increase with each additional group to which an allocation is made.

● Impact on Equity

Equity has various definition including "freedom from bias or favoritism" (Merriam-Webster dictionary) and conformity with rules or standards. Unlike net economic benefits, we do not have measures of equity that are commonly accepted standards against which we can evaluate the effects of an action. The best we can do is provide information on effects that are generally believed to have equity implications and rely on decision makers to balance these considerations with conservation and efficiency objectives for which there are more commonly accepted standards. With respect to equity considerations and initial allocation, the MSA directs that consideration be given to (i) current and historical harvests; (ii) employment in the harvesting and processing sectors; (iii) investments in and dependence upon the fishery; and (iv) the current and historical participation of fishing communities (Section 303B(5)). Items (ii) and (iii) are discussed above. Items (i) and (iv) will be discussed in this section. Specifically we will discuss

- Compensation for harm
- Excessive shares
- Current and historic harvests

♦ *Compensation for Harm*

"Compensation for harm" is an equity rationale that has been proposed for guiding the initial distribution of QS. The potential adverse impacts of the IFQ program on capital assets and labor assets are discussed in the above section on "Sector Health." Potential adverse affects on communities is discussed in Section 4.x.x.

With respect to an initial distribution of QS to communities to protect them from potential harm, a number of potential policies for protecting communities were considered by the Council in November 2005. Difficulties with direct allocation to communities included identifying the community representatives to whom allocations would be made. At that time, community representatives were expressing little interest in receiving a direct allocation. It was decided that the design of the program would allow interested communities to acquire shares on their own and use them as leverage to support a groundfish trawl industry. Since then, the Council has added for consideration an adaptive management program which may be used to adjust for adverse impacts on communities. There are two ways we might look at the effect of the initial allocation among communities. First, recognizing the QS can easily be moved between communities we can look at the locations of the home offices for permits and processors receiving an initial allocation and how the distributions among these locations would vary depending on choices made with respect to the amount allocated to processors and harvesters. Table 41 provides information on how nonwhiting QS shifts among communities as the balance of the initial allocation shifts between processors and permits.

Table 41. Distribution of non-whiting QS allocations by QS owners' residence and/or head office.

	Catch History-Based Allocation			Catch History-Based Allocation + Equal Allocation of Buyback History			Difference Between Catch History-Based Allocation and Equal Allocation (%)		
		Difference Relative to 75% Allocation to Harvesters (%)			Difference Relative to 75% Allocation to Harvesters (%)				
QS Owner's Home	Annual Value of Non-whiting QP Allocation (75% to Processors) ($ exvessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	Annual Value of Non-whiting QP Allocation (75% to Processors) ($ exvessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	75% Allocation to Harvesters	87.5% Allocation to Harvesters	100% Allocation to Harvesters
ANACORTES	$212,407	16.67%	33.33%	$211,305	16.67%	33.33%	0.52%	0.52%	0.52%
Bellingham	$971,007	-19.31%	-38.63%	$842,506	-24.69%	-49.37%	15.25%	23.48%	39.72%
Blaine	$84,050	-50.00%	-100.00%	$83,201	-50.00%	-100.00%	1.02%	1.02%	
Neah Bay	$1,190	-50.00%	-100.00%	$49,115	15.02%	30.04%	-97.58%	-98.95%	-100.00%
CENTRALIA	$174,901	16.67%	33.33%	$139,951	16.67%	33.33%	24.97%	24.97%	24.97%
Port Angeles	$62,759	-50.00%	-100.00%	$62,687	-50.00%	-100.00%	0.12%	0.12%	
Port Townsend	$20	-50.02%	-100.00%	$20	-50.02%	-100.00%	0.00%	0.00%	
Seattle	$2,019,679	4.72%	9.44%	$2,128,101	5.33%	10.66%	-5.09%	-5.64%	-6.14%
Aberdeen	$287,485	16.67%	33.33%	$297,014	16.67%	33.33%	-3.21%	-3.21%	-3.21%
La Push	$1,619	-50.00%	-100.00%	$1,619	-50.00%	-100.00%	0.00%	0.00%	
WESTPORT	$3,867	-50.00%	-100.00%	$3,867	-50.00%	-100.00%	0.00%	0.00%	
Willapa Bay	$314,878	11.28%	22.55%	$367,495	12.05%	24.10%	-14.32%	-14.91%	-15.38%
Illwaco	$38,013	-50.00%	-100.00%	$86,204	-12.95%	-25.91%	-55.90%	-74.67%	-100.00%
Astoria	$2,471,953	15.73%	31.46%	$2,164,689	15.60%	31.20%	14.19%	14.33%	14.43%
OREGON CITY	$95,689	16.67%	33.33%	$99,502	16.67%	33.33%	-3.83%	-3.83%	-3.83%
Garibaldi	$531,779	13.20%	26.40%	$489,056	12.90%	25.80%	8.74%	9.03%	9.26%
Clackamas	$3,662,937	-29.84%	-59.67%	$3,578,482	-30.95%	-61.90%	2.36%	4.01%	8.34%
DALLAS, OR	$66,111	16.67%	33.33%	$83,388	16.67%	33.33%	-20.72%	-20.72%	-20.72%
Newport	$1,560,981	15.35%	30.70%	$2,001,572	15.64%	31.28%	-22.01%	-22.21%	-22.36%
Waldport	$0	-50.33%	-100.00%	$0	-50.41%	-100.00%	6.56%	6.71%	
Florence	$94,495	12.50%	25.01%	$101,389	12.79%	25.57%	-6.80%	-7.03%	-7.22%
Winchester Bay	$8	-49.66%	-100.00%	$8	-49.66%	-100.00%	0.00%	0.00%	
Charleston	$2,106,662	15.86%	31.72%	$1,871,830	15.76%	31.52%	12.55%	12.65%	12.72%
BANDON	$153,499	16.67%	33.33%	$178,761	16.67%	33.33%	-14.13%	-14.13%	-14.13%
PORT ORFORD	$149,769	16.67%	33.33%	$129,412	16.67%	33.33%	15.73%	15.73%	15.73%
Gold Beach	$10	-50.27%	-100.00%	$10	-50.27%	-100.00%	0.00%	0.00%	
Brookings	$978,006	16.34%	32.68%	$956,392	16.33%	32.66%	2.26%	2.27%	2.27%
Eureka	$201,702	12.66%	25.31%	$354,739	14.37%	28.74%	-43.14%	-43.99%	-44.65%

Table 41. Distribution of non-whiting QS allocations by QS owners' residence and/or head office.

	Catch History-Based Allocation			Catch History-Based Allocation + Equal Allocation of Buyback History					
		Difference Relative to 75% Allocation to Harvesters (%)			Difference Relative to 75% Allocation to Harvesters (%)		Difference Between Catch History-Based Allocation and Equal Allocation (%)		
QS Owner's Home	Annual Value of Non-whiting QP Allocation (75% to Processors) ($ exvessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	Annual Value of Non-whiting QP Allocation (75% to Processors) ($ exvessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	75% Allocation to Harvesters	87.5% Allocation to Harvesters	100% Allocation to Harvesters
Crescent City	$476,553	11.92%	23.84%	$466,055	11.81%	23.62%	2.25%	2.35%	2.43%
Fields Landing	$630,426	-9.40%	-18.81%	$596,988	-10.86%	-21.73%	5.60%	7.33%	9.54%
Ukiah	$1,606,408	2.94%	5.89%	$1,414,581	1.08%	2.16%	13.56%	15.65%	17.70%
Trinidad	$17	-50.19%	-100.00%	$17	-50.19%	-100.00%	0.00%	0.00%	
Bodega Bay	$195,704	-9.76%	-19.53%	$332,697	1.06%	2.12%	-41.18%	-47.48%	-53.65%
San Francisco	$1,880,781	-5.59%	-11.17%	$1,802,095	-6.56%	-13.11%	4.37%	5.45%	6.70%
Half Moon Bay	$635,586	6.63%	13.27%	$792,227	8.60%	17.19%	-19.77%	-21.22%	-22.46%
Gilroy	$10,811	-50.00%	-100.00%	$10,812	-50.00%	-100.00%	0.00%	0.00%	
Oakland	$876	-50.00%	-100.00%	$877	-50.00%	-100.00%	-0.05%	-0.05%	
Alameda	$0	-49.97%	-100.00%	$0	-49.97%	-100.00%	0.00%	0.00%	
MONTEREY	$1,052,749	-9.10%	-18.20%	$963,028	-11.52%	-23.04%	9.32%	12.31%	16.19%
Moss Landing	$293,323	13.22%	26.45%	$271,249	12.94%	25.89%	8.14%	8.41%	8.62%
Santa Cruz	$136,865	15.90%	31.80%	$174,504	16.03%	32.05%	-21.57%	-21.66%	-21.72%
Avila Beach	$19,931	-50.00%	-100.00%	$19,931	-50.00%	-100.00%	0.00%	0.00%	
Port Hueneme	$4	-50.00%	-100.00%	$4	-50.00%	-100.00%	0.00%	0.00%	
Morro Bay	$213,111	-23.58%	-47.15%	$223,820	-21.66%	-43.32%	-4.78%	-7.11%	-11.21%
Camarillo	$32	-50.06%	-100.00%	$32	-50.06%	-100.00%	0.00%	0.00%	
Goleta	$1	-50.63%	-100.00%	$1	-50.63%	-100.00%	0.00%	0.00%	
Ventura	$21	-49.76%	-100.00%	$21	-49.76%	-100.00%	0.00%	0.00%	
Bakersfield	$45	-50.00%	-100.00%	$45	-50.00%	-100.00%	0.00%	0.00%	
Los Angeles area	$10,523	-50.00%	-100.00%	$10,523	-50.00%	-100.00%	0.00%	0.00%	
San Pedro	$1	-49.10%	-100.00%	$1	-49.10%	-100.00%	0.00%	0.00%	
San Diego	$42	-50.02%	-100.00%	$43	-50.02%	-100.00%	-1.79%	-1.79%	
Arizona	$62	-49.89%	-100.00%	$62	-49.89%	-100.00%	0.00%	0.00%	
Hawaii	$0	16.07%	32.14%	$47,902	16.67%	33.33%	-100.00%	-100.00%	-100.00%
Unknown	$61,343	-50.00%	-100.00%	$61,343	-50.00%	-100.00%	0.00%	0.00%	

♦ *Excessive Shares*

What constitutes **"excessive shares"** may be socially determined or economically determined. On an economic basis, an excessive share would be one that would be expected to result in a sector with market power. This concern is addressed above in the section net benefit related effects. From a social policy perspective concentration of ownership affects the social and community structure and the sense of equity that may, in part, be grounded in the history of fishery management, which is largely based on common property concepts. The choice of the amounts of the initial allocation that goes to harvesters and processors affects whether or not there may be excessive shares only to the degree that there is a grandfather clause to the accumulation limits. Tables X.X in Section A-2.2.3.E. (TEMPORAY REFERENCE TO Table 43 THROUGH Table 49 of this document) on grandfather clauses show the amounts of QS that would be allocated in excess of the accumulation limits, depending on the split of the allocation among harvesters and processors.

♦ *Current and Historic Harvests*

With respect to the question of the distribution of initial allocation between permits and processors, it is apparent that the distribution of more or less to permits and processors will proportionally affect the distance between what they receive and what they need to continue at production levels of the recent past. Here will examine the effect of this decision on trading relationships. The question to be evaluated is "If permits and processors wish to maintain their historic practices with respect to the amounts of fish each permit delivers to each processor, how will the decision on the split of QS between these groups affect their ability to do so?" For the purpose of this evaluation we looked at the pattern of deliveries among vessels and processors for 2004 through 2006. In Figure 10 we plot the amounts of QS allocated to these trading relationships from the processor's perspective in contrast to the amount each relationship traded in the 2004-2006 period. The figure on the left shows the results if 100 percent of the nonwhiting QS allocation goes to permits and the figures on the right shows the results if 75 percent of the nonwhiting allocation goes to permits and 25 percent to processors. The top figures show the general distribution without showing the units. At any point along the diagonal line from the origin the trading relationship will receive an amount of QS that is comparable to its 2004–06 harvest. The bottom figures show the distribution among those trading relationships with less than $200,000 of QS and less than $200,000 of 2004–06 landings history. The left-hand panel shows that with a 100 percent allocation to permits there are some processor-permit associations that will receive little or no QS history relative to their 2004–06 activities. For example, in the top and bottom left hand panel combined shows that there are only five processor-permit associations with more than $20,000 of history for 2004–06 that will receive QS less than what would be needed to maintain their 2004-06 average. If a 25 percent allocation is given to processors, the right hand panel shows three trading relationships in this category. The right-hand panel also shows that if there is a 25 percent allocation to processors 8 trading relationships that had less than about $25,000 of 2004–06 history will receive more than about $60,000 of QS. Figure 11 shows a comparison of the allocations with 75 percent going to harvesters (vertical axis and 100 percent going to harvesters (horizontal axis). In this figure it is seen that trading partnerships which involved more than $40,000 in exvessel value faired better under the 100 percent allocation to permits. To better understand these results Table 42 is provided. This table displays the number of permits delivering to processors based on the 2004-2006 deliveries. This table shows that most processors with less than $20,000 of 2004-06 history received deliveries from only one or two permits. Of the total of 42 processors falling in this category six received from between three and five permits and two from seven or eight permits. It should be noted that some permits deliver to more than one processor and so will be counted more than once in the table. NEED FIGURES AND TABLES LIKE THESE FOR WHITING

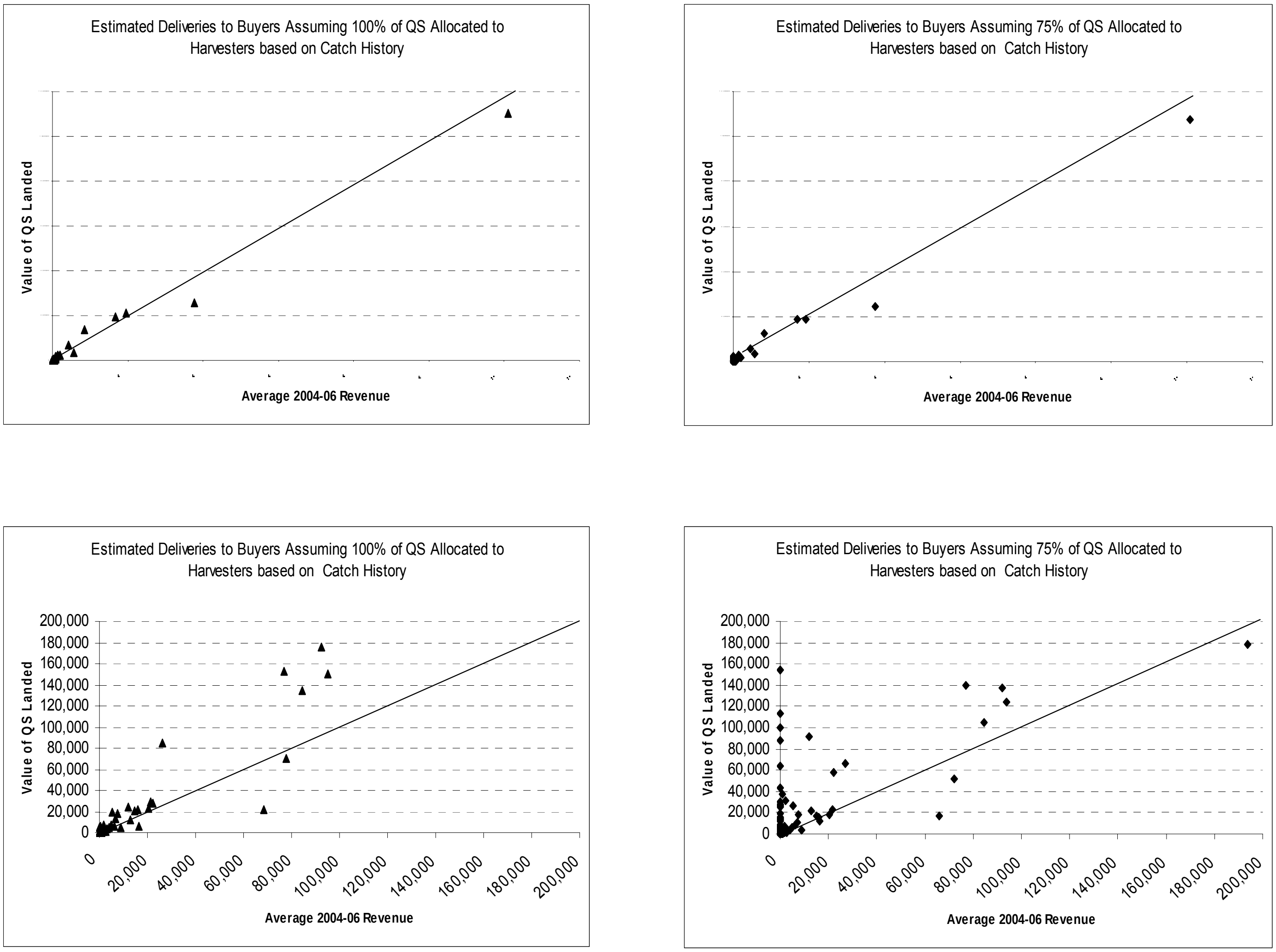
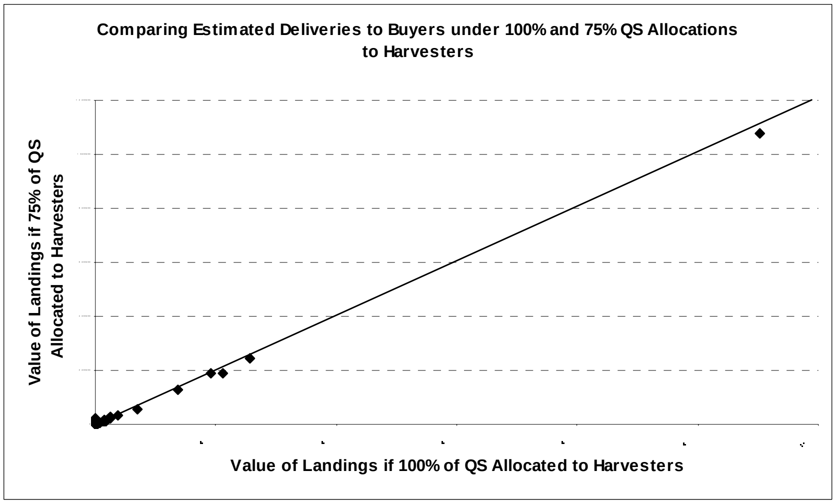


Figure 10. Nonwhiting QS going to processor-permit relationships compared to 2004–06 exvessel revenue for those relationships.



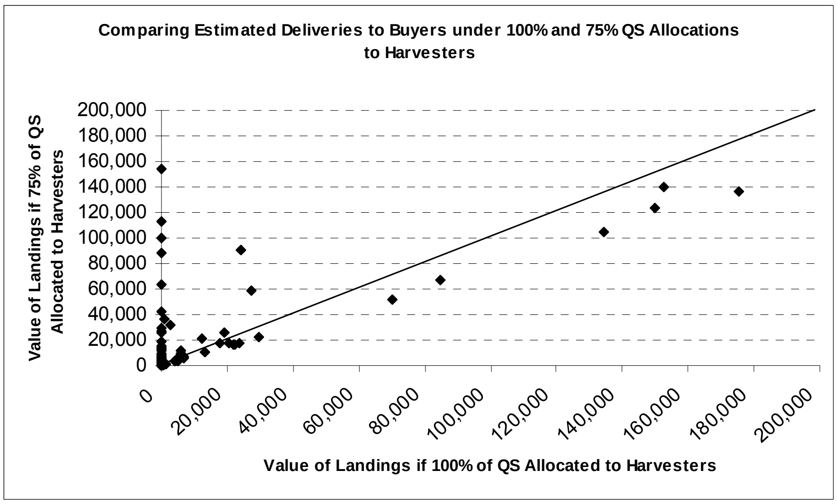


Figure 11. Nonwhiting QS going to processor-permit relationships under a 100 percent allocation to permits as compared to a 75 percent allocation to permits.

Table 42. Number of deliveries by number of permits delivering to a processors categorized based on average of annual 2004-06 exvessel value of deliveries received by the processor.

	2004–06 average buyer purchases ($ ex-vessel payments)						
Number of Permits Delivering	<10,000	10,000-20,000	20,000-100,000	100,000-250,000	240,000–1 Million	>1 Million	Total
1	22	1	2	1	0	0	26
2	11	0	1	0	1	0	13
3	1	1	3	1	0	0	6
4-5	2	2	2	0	1	0	7
6-8	1	1	2	1	0	0	5
9-20	0	0	0	1	1	1	3
21-100	0	0	0	0	0	3	3
Total	37	5	10	4	3	4	63

One way to take into account current harvests up to the date of the allocation is to attach the allocation criteria to an asset that is transferable as participants enter and exit the fishery (as opposed to the entity, which may no longer be a participant in the fishery). On the harvester side, the vessel (under Amendment 6) and the permits (under Amendment 8, which was tabled and Amendment 9) and the sablefish tier system have been used as the asset against which qualification criteria are measured. Anecdotal information suggests that fishermen have been relying on the permit to be the most likely vehicle that the Council would use for the allocation of QS. Allocation based on criteria related to other assets, such as the vessel or a processing facility, would be viewed as a change from past practices. For processors, to this point it has not been necessary to identify such a key asset. In section A-2.1.1.d consideration will be given to how historic participation criteria might be specified so as to take into account exit and new entry during the period of time that this program has been under deliberation.

SUMMARY

- **Compensation for Harm:** QS may be issued to those with assets that will be adversely affected by the IFQ program (see sections above on sector health). Rather than allocating QS to communities, the Council has ensured that communities can purchase QS if they desire, and is considering an adaptive management program (Section A-3).
- **Excessive Shares**. With respect to equity issues, determination of what constitutes an excessive shares is a value judgment made by the Council. Tables and graphs are provided to that show the expected concentration of shares in comparison to recent harvest levels for various groups. CROSS REFERENCES TO BE ADDED.
- **Current and Historic Harvests.** Figures are provided comparing how processor-permit trading partnerships fair with and without an allocation to processors. In general, partnerships with an average exvessel revenue of greater than $40,000 from 2004-2006 fare better with a 100% allocation to harvesters than with a 75/25 permit/processor split.

Table 43 Harvesting and processing entities receiving allocations above control limits (**QS allocated 100% to permits,** no equal sharing of buyback history).

	# entities receiving QS	MAX QS Alloc.	Control Limit Option 1: Limit	Control Limit Option 1: Number of Entities Over the Limit	Control Limit Option 1: Total QS Allocated to Entities Over the Limit	Control Limit Option 2: Limit	Control Limit Option 2: Number of Entities Over the Limit	Control Limit Option 2: Total QS Allocated to Entities Over the Limit
Aggregate Non-Whiting Groundish (NWGF)	116	0.051	0.015	20	0.475	0.022	7	0.229
Ling C	112	0.058	0.05	1	0.058	0.075	0	0.000
Ling N	85	0.047	0.05	0	0.000	0.075	0	0.000
Ling S	68	0.083	0.05	8	0.498	0.075	1	0.083
Pcod	87	0.204	0.05	6	0.726	0.075	4	0.590
Pwhit_SN	59	0.147	0.1	2	0.265	0.15	0	0.000
Pwhit_SW	47	0.115	0.1	1	0.115	0.15	0	0.000
Pwhit_CV	28	0.102	0.1	1	0.102	0.15	0	0.000
Pwhit_CP	4	0.535	0.5	1	0.535	0.55	0	0.000
Comb whit	54	0.206	0.15	1	0.206	0.225	0	0.000
Sable C	112	0.047	0.019	13	0.351	0.029	4	0.159
Sable N	112	0.048	0.02	10	0.288	0.03	3	0.129
Sable S	24	0.488	0.05	3	0.827	0.075	3	0.827
POP	96	0.068	0.05	3	0.173	0.075	0	0.000
Shortbelly	92	0.365	0.05	3	0.554	0.075	3	0.554
Widow	115	0.081	0.034	4	0.234	0.051	2	0.146
Canary	113	0.061	0.05	1	0.061	0.075	0	0.000
Chili	63	0.118	0.05	8	0.706	0.075	5	0.520
Bocaccio	54	0.178	0.05	6	0.566	0.075	2	0.317
Splitnose	57	0.133	0.05	6	0.615	0.075	5	0.560
Yellowtail	99	0.086	0.05	2	0.149	0.075	1	0.086
Shortspine C	110	0.072	0.031	4	0.191	0.047	1	0.072
Shortspine N	97	0.056	0.048	1	0.056	0.072	0	0.000
Shortspine S	73	0.198	0.047	4	0.430	0.071	3	0.382
Longspine C	109	0.056	0.02	13	0.427	0.03	5	0.228
Longspine N	109	0.056	0.02	13	0.427	0.03	5	0.228
Longspine S	1	1.000	0.05	1	1.000	0.075	1	1.000
Cowcod	1	1.000	0.05	1	1.000	0.075	1	1.000
Darkblotched	112	0.092	0.05	3	0.233	0.075	2	0.181
Yelloweye	108	0.089	0.05	5	0.323	0.075	1	0.089
Black RF C	69	0.151	0.05	5	0.460	0.075	4	0.400
Black RF WA	17	0.403	0.05	4	0.969	0.075	4	0.969
Black RF O-C	61	0.167	0.05	5	0.487	0.075	3	0.349
Minor RF N	113	0.064	0.05	2	0.115	0.075	0	0.000
MRN NS	44	0.308	0.05	4	0.564	0.075	3	0.491
MRN SH	113	0.067	0.04	4	0.209	0.06	1	0.067
MRN SL	98	0.060	0.05	4	0.212	0.075	0	0.000
Minor RF S	79	0.157	0.05	7	0.561	0.075	3	0.343
MRS NS	39	0.176	0.05	7	0.731	0.075	4	0.540
MRS SH	74	0.099	0.05	8	0.611	0.075	4	0.390
MRS SL	73	0.182	0.05	5	0.488	0.075	3	0.384
CA Scorp	2	0.673	0.05	2	1.000	0.075	2	1.000
Cabezon CA	2	0.620	0.05	2	1.000	0.075	2	1.000
Dover Sole	113	0.062	0.018	13	0.377	0.027	4	0.187
Eng Sole	112	0.094	0.1	0	0.000	0.15	0	0.000
Petrale C	113	0.056	0.029	5	0.207	0.044	2	0.107
Arrowtooth	98	0.130	0.05	6	0.519	0.075	3	0.325
Starry Fl	64	0.346	0.05	4	0.590	0.075	3	0.524
Other FF	113	0.135	0.1	1	0.135	0.15	0	0.000
Other GF	101	0.108	0.05	4	0.326	0.075	2	0.208

Table 44 Processing entities receiving allocations above control limits (**QS allocated 100% to permits**, no equal sharing of buyback history)

			Control Limit Option 1			Control Limit Option 2		
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	8	0.051	0.015	3	0.089	0.022	1	0.051
Ling C	8	0.058	0.05	1	0.058	0.075	0	0.000
Ling N	2	0.047	0.05	0	0.000	0.075	0	0.000
Ling S	8	0.083	0.05	3	0.203	0.075	1	0.083
Pcod	3	0.187	0.05	1	0.187	0.075	1	0.187
Pwhit_SN	5	0.073	0.1	0	0.000	0.15	0	0.000
Pwhit_SW	1	0.038	0.1	0	0.000	0.15	0	0.000
Pwhit_CV	3	0.102	0.1	1	0.102	0.15	0	0.000
Pwhit_CP	4	0.535	0.5	1	0.535	0.55	0	0.000
Comb whit	7	0.206	0.15	1	0.206	0.225	0	0.000
Sable C	8	0.047	0.019	2	0.067	0.029	1	0.047
Sable N	8	0.048	0.02	2	0.069	0.03	1	0.048
Sable S	4	0.013	0.05	0	0.000	0.075	0	0.000
POP	3	0.068	0.05	1	0.068	0.075	0	0.000
Shortbelly	8	0.038	0.05	0	0.000	0.075	0	0.000
Widow	8	0.033	0.034	0	0.000	0.051	0	0.000
Canary	8	0.046	0.05	0	0.000	0.075	0	0.000
Chili	7	0.118	0.05	2	0.180	0.075	1	0.118
Bocaccio	7	0.061	0.05	2	0.116	0.075	0	0.000
Splitnose	7	0.092	0.05	1	0.092	0.075	1	0.092
Yellowtail	3	0.086	0.05	1	0.086	0.075	1	0.086
Shortspine C	6	0.042	0.031	1	0.042	0.047	0	0.000
Shortspine N	3	0.043	0.048	0	0.000	0.072	0	0.000
Shortspine S	5	0.044	0.047	0	0.000	0.071	0	0.000
Longspine C	6	0.044	0.02	2	0.069	0.03	1	0.044
Longspine N	6	0.044	0.02	2	0.069	0.03	1	0.044
Longspine S	0	0.000	0.05	0	0.000	0.075	0	0.000
Cowcod	0	0.000	0.05	0	0.000	0.075	0	0.000
Darkblotched	8	0.040	0.05	0	0.000	0.075	0	0.000
Yelloweye	8	0.018	0.05	0	0.000	0.075	0	0.000
Black RF C	5	0.087	0.05	3	0.249	0.075	3	0.249
Black RF WA	1	0.001	0.05	0	0.000	0.075	0	0.000
Black RF O-C	5	0.097	0.05	3	0.256	0.075	2	0.182
Minor RF N	8	0.041	0.05	0	0.000	0.075	0	0.000
MRN NS	3	0.308	0.05	1	0.308	0.075	1	0.308
MRN SH	8	0.047	0.04	1	0.047	0.06	0	0.000
MRN SL	3	0.035	0.05	0	0.000	0.075	0	0.000
Minor RF S	7	0.054	0.05	3	0.160	0.075	0	0.000
MRS NS	6	0.150	0.05	1	0.150	0.075	1	0.150
MRS SH	7	0.098	0.05	4	0.302	0.075	2	0.192
MRS SL	7	0.052	0.05	1	0.052	0.075	0	0.000
CA Scorp	0	0.000	0.05	0	0.000	0.075	0	0.000
Cabezon CA	0	0.000	0.05	0	0.000	0.075	0	0.000
Dover Sole	8	0.048	0.018	2	0.066	0.027	1	0.048
Eng Sole	8	0.094	0.1	0	0.000	0.15	0	0.000
Petrale C	8	0.051	0.029	2	0.083	0.044	1	0.051
Arrowtooth	5	0.068	0.05	1	0.068	0.075	0	0.000
Starry Fl	4	0.036	0.05	0	0.000	0.075	0	0.000
Other FF	8	0.135	0.1	1	0.135	0.15	0	0.000
Other GF	8	0.026	0.05	0	0.000	0.075	0	0.000

Table 45 Harvesting and processing entities receiving allocations above control limits (**QS allocated 100% to permits, with equal sharing** of buyback history).

			Control Limit Option 1			Control Limit Option 2		
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	121	0.049	0.015	14	0.317	0.022	4	0.139
Ling C	121	0.053	0.05	1	0.053	0.075	0	0.000
Ling N	121	0.047	0.05	0	0.000	0.075	0	0.000
Ling S	121	0.068	0.05	2	0.120	0.075	0	0.000
Pcod	121	0.114	0.05	3	0.272	0.075	2	0.214
Pwhit_SN	121	0.087	0.1	0	0.000	0.15	0	0.000
Pwhit_SW	121	0.107	0.1	1	0.107	0.15	0	0.000
Pwhit_CV	121	0.096	0.1	0	0.000	0.15	0	0.000
Pwhit_CP	4	0.535	0.5	1	0.535	0.75	0	0.000
Comb whit	124	0.205	0.15	1	0.205	0.225	0	0.000
Sable C	121	0.047	0.019	6	0.181	0.029	3	0.111
Sable N	121	0.048	0.02	6	0.174	0.03	2	0.078
Sable S	121	0.321	0.05	3	0.540	0.075	2	0.471
POP	121	0.058	0.05	1	0.058	0.075	0	0.000
Shortbelly	121	0.206	0.05	2	0.274	0.075	1	0.206
Widow	121	0.054	0.034	3	0.140	0.051	1	0.054
Canary	121	0.046	0.05	0	0.000	0.075	0	0.000
Chili	121	0.097	0.05	7	0.545	0.075	4	0.360
Bocaccio	121	0.148	0.05	5	0.439	0.075	2	0.268
Splitnose	121	0.104	0.05	5	0.441	0.075	4	0.370
Yellowtail	121	0.069	0.05	1	0.069	0.075	0	0.000
Shortspine C	121	0.055	0.031	2	0.100	0.047	1	0.055
Shortspine N	121	0.045	0.048	0	0.000	0.072	0	0.000
Shortspine S	121	0.143	0.047	3	0.276	0.071	2	0.218
Longspine C	121	0.046	0.02	9	0.269	0.03	4	0.160
Longspine N	121	0.046	0.02	9	0.269	0.03	4	0.160
Longspine S	121	0.646	0.05	1	0.646	0.075	1	0.646
Cowcod	121	0.448	0.05	1	0.448	0.075	1	0.448
Darkblotched	121	0.056	0.05	2	0.110	0.075	0	0.000
Yelloweye	121	0.060	0.05	1	0.060	0.075	0	0.000
Black RF C	121	0.117	0.05	4	0.321	0.075	2	0.195
Black RF WA	121	0.135	0.05	2	0.262	0.075	2	0.262
Black RF O-C	121	0.139	0.05	5	0.415	0.075	2	0.228
Minor RF N	121	0.044	0.05	0	0.000	0.075	0	0.000
MRN NS	121	0.128	0.05	1	0.128	0.075	1	0.128
MRN SH	121	0.047	0.04	2	0.092	0.06	0	0.000
MRN SL	121	0.041	0.05	0	0.000	0.075	0	0.000
Minor RF S	121	0.119	0.05	4	0.308	0.075	1	0.119
MRS NS	121	0.136	0.05	5	0.454	0.075	4	0.404
MRS SH	121	0.083	0.05	5	0.362	0.075	2	0.161
MRS SL	121	0.133	0.05	4	0.328	0.075	2	0.210
CA Scorp	121	0.633	0.05	2	0.941	0.075	2	0.941
Cabezon CA	121	0.595	0.05	2	0.960	0.075	2	0.960
Dover Sole	121	0.050	0.018	8	0.230	0.027	4	0.155
Eng Sole	121	0.075	0.1	0	0.000	0.15	0	0.000
Petrale C	121	0.049	0.029	3	0.121	0.044	1	0.049
Arrowtooth	121	0.062	0.05	3	0.172	0.075	0	0.000
Starry Fl	121	0.305	0.05	4	0.521	0.075	3	0.463
Other FF	121	0.092	0.1	0	0.000	0.15	0	0.000
Other GF	121	0.071	0.05	2	0.137	0.075	0	0.000

Table 46 Processing entities receiving allocations above control limits **(**QS allocated 100% to permits**,** with equal sharing **of buyback history)**

				Control Limit Option 1			Control Limit Option 2	
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	8	0.049368	0.015	2	0.065889879	0.022	1	0.049367537
Ling C	8	0.052951	0.05	1	0.052951299	0.075	0	0
Ling N	8	0.046926	0.05	0	0	0.075	0	0
Ling S	8	0.068463	0.05	1	0.068463104	0.075	0	0
Pcod	8	0.11377	0.05	1	0.113769841	0.075	1	0.113769841
Pwhit_SN	8	0.046771	0.1	0	0	0.15	0	0
Pwhit_SW	3	0.036405	0.1	0	0	0.15	0	0
Pwhit_CV	3	0.095748	0.1	0	0	0.15	0	0
Pwhit_CP	4	0.535326	0.5	1	0.53532631	0.75	0	0
Comb whit	9	0.204991	0.15	1	0.204990569	0.225	0	0
Sable C	8	0.047179	0.019	1	0.047179278	0.029	1	0.047179278
Sable N	8	0.047766	0.02	1	0.047766142	0.03	1	0.047766142
Sable S	8	0.025797	0.05	0	0	0.075	0	0
POP	8	0.0585	0.05	1	0.058499947	0.075	0	0
Shortbelly	8	0.033414	0.05	0	0	0.075	0	0
Widow	8	0.038162	0.034	1	0.038161779	0.051	0	0
Canary	8	0.046377	0.05	0	0	0.075	0	0
Chili	8	0.095559	0.05	2	0.154413472	0.075	1	0.095558921
Bocaccio	8	0.058838	0.05	1	0.05883755	0.075	0	0
Splitnose	8	0.070637	0.05	1	0.070636902	0.075	0	0
Yellowtail	8	0.069225	0.05	1	0.069225092	0.075	0	0
Shortspine C	8	0.044359	0.031	1	0.044359158	0.047	0	0
Shortspine N	8	0.045119	0.048	0	0	0.072	0	0
Shortspine S	8	0.040891	0.047	0	0	0.071	0	0
Longspine C	8	0.045581	0.02	1	0.045580576	0.03	1	0.045580576
Longspine N	8	0.045581	0.02	1	0.04558144	0.03	1	0.04558144
Longspine S	8	0.016869	0.05	0	0	0.075	0	0
Cowcod	8	0.026453	0.05	0	0	0.075	0	0
Darkblotched	8	0.043708	0.05	0	0	0.075	0	0
Yelloweye	8	0.02836	0.05	0	0	0.075	0	0
Black RF C	8	0.077602	0.05	3	0.204231702	0.075	1	0.077602222
Black RF WA	8	0.032348	0.05	0	0	0.075	0	0
Black RF O-C	8	0.088419	0.05	3	0.222035088	0.075	1	0.088419396
Minor RF N	8	0.043885	0.05	0	0	0.075	0	0
MRN NS	8	0.127927	0.05	1	0.12792687	0.075	1	0.12792687
MRN SH	8	0.047302	0.04	1	0.047302211	0.06	0	0
MRN SL	8	0.040581	0.05	0	0	0.075	0	0
Minor RF S	8	0.051896	0.05	1	0.051896419	0.075	0	0
MRS NS	8	0.108905	0.05	1	0.108905046	0.075	1	0.108905046
MRS SH	8	0.074621	0.05	3	0.201027625	0.075	0	0
MRS SL	8	0.050595	0.05	1	0.050594577	0.075	0	0
CA Scorp	8	0.002939	0.05	0	0	0.075	0	0
Cabezon CA	8	0.001947	0.05	0	0	0.075	0	0
Dover Sole	8	0.047644	0.018	1	0.0476437	0.027	1	0.0476437
Eng Sole	8	0.075442	0.1	0	0	0.15	0	0
Petrale C	8	0.04938	0.029	1	0.049379955	0.044	1	0.049379955
Arrowtooth	8	0.056886	0.05	1	0.05688561	0.075	0	0
Starry Fl	8	0.037327	0.05	0	0	0.075	0	0
Other FF	8	0.091888	0.1	0	0	0.15	0	0
Other GF	8	0.034438	0.05	0	0	0.075	0	0

Table 47. Harvesting and processing entities receiving allocations above control limits (QS allocated 75% to permits and 25% based on processing history, no equal sharing of buyback history).

				Control Limit Option 1			Control Limit Option 2	
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	297	0.140	0.015	14	0.426	0.022	7	0.309
Ling C	235	0.145	0.05	1	0.145	0.075	1	0.145
Ling N	134	0.140	0.05	1	0.140	0.075	1	0.140
Ling S	147	0.154	0.05	2	0.206	0.075	1	0.154
Pcod	131	0.199	0.05	6	0.603	0.075	3	0.434
Pwhit_SN	85	0.123	0.1	2	0.234	0.15	0	0.000
Pwhit_SW	67	0.086	0.1	0	0.000	0.15	0	0.000
Pwhit_CV	31	0.128	0.1	1	0.128	0.15	0	0.000
Pwhit_CP	4	0.535	0.5	1	0.535	0.55	0	0.000
Comb whit	75	0.212	0.15	1	0.212	0.225	0	0.000
Sable C	224	0.156	0.019	6	0.301	0.029	3	0.222
Sable N	217	0.162	0.02	5	0.286	0.03	3	0.230
Sable S	51	0.366	0.05	5	0.808	0.075	4	0.754
POP	156	0.168	0.05	2	0.230	0.075	1	0.168
Shortbelly	133	0.274	0.05	4	0.545	0.075	3	0.486
Widow	211	0.134	0.034	4	0.287	0.051	2	0.195
Canary	218	0.135	0.05	1	0.135	0.075	1	0.135
Chili	135	0.117	0.05	6	0.496	0.075	4	0.361
Bocaccio	118	0.133	0.05	5	0.420	0.075	2	0.238
Splitnose	127	0.131	0.05	5	0.482	0.075	4	0.412
Yellowtail	159	0.173	0.05	1	0.173	0.075	1	0.173
Shortspine C	207	0.142	0.031	4	0.265	0.047	2	0.196
Shortspine N	150	0.175	0.048	1	0.175	0.072	1	0.175
Shortspine S	131	0.149	0.047	5	0.463	0.071	4	0.403
Longspine C	190	0.155	0.02	10	0.427	0.03	5	0.308
Longspine N	189	0.155	0.02	10	0.427	0.03	5	0.308
Longspine S	2	0.750	0.05	2	1.000	0.075	2	1.000
Cowcod	3	0.750	0.05	3	1.000	0.075	3	1.000
Darkblotched	224	0.154	0.05	3	0.290	0.075	1	0.154
Yelloweye	186	0.111	0.05	2	0.177	0.075	1	0.111
Black RF C	101	0.187	0.05	5	0.490	0.075	3	0.380
Black RF WA	26	0.302	0.05	6	0.933	0.075	4	0.792
Black RF O-C	86	0.203	0.05	5	0.519	0.075	3	0.410
Minor RF N	228	0.154	0.05	1	0.154	0.075	1	0.154
MRN NS	56	0.231	0.05	5	0.546	0.075	2	0.354
MRN SH	223	0.145	0.04	3	0.245	0.06	1	0.145
MRN SL	165	0.154	0.05	1	0.154	0.075	1	0.154
Minor RF S	176	0.117	0.05	6	0.485	0.075	2	0.221
MRS NS	75	0.141	0.05	5	0.486	0.075	4	0.434
MRS SH	167	0.114	0.05	5	0.440	0.075	3	0.292
MRS SL	151	0.136	0.05	5	0.447	0.075	3	0.310
CA Scorp	9	0.505	0.05	5	0.936	0.075	2	0.750
Cabezon CA	8	0.465	0.05	3	0.833	0.075	3	0.833
Dover Sole	215	0.149	0.018	9	0.372	0.027	6	0.313
Eng Sole	226	0.166	0.1	1	0.166	0.15	1	0.166
Petrale C	248	0.142	0.029	4	0.265	0.044	2	0.190
Arrowtooth	146	0.140	0.05	6	0.538	0.075	4	0.420
Starry Fl	107	0.260	0.05	4	0.579	0.075	2	0.446
Other FF	247	0.125	0.1	2	0.228	0.15	0	0.000
Other GF	172	0.159	0.05	3	0.315	0.075	2	0.241

Table 48. Processing entities receiving allocations above control limits **(QS allocated 75% to permits and 25% based on processing history,** no equal sharing of buyback history)**.**

				Control Limit Option 1			Control Limit Option 2	
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	189	0.140	0.015	4	0.230	0.022	4	0.230
Ling C	131	0.145	0.05	1	0.145	0.075	1	0.145
Ling N	55	0.140	0.05	1	0.140	0.075	1	0.140
Ling S	87	0.154	0.05	2	0.206	0.075	1	0.154
Pcod	51	0.199	0.05	1	0.199	0.075	1	0.199
Pwhit_SN	32	0.123	0.1	1	0.123	0.15	0	0.000
Pwhit_SW	21	0.078	0.1	0	0.000	0.15	0	0.000
Pwhit_CV	5	0.128	0.1	2	0.252	0.15	0	0.000
Pwhit_CP	4	0.535	0.5	1	0.535	0.55	0	0.000
Comb whit	28	0.212	0.15	1	0.212	0.225	0	0.000
Sable C	120	0.156	0.019	3	0.217	0.029	2	0.192
Sable N	113	0.162	0.02	3	0.225	0.03	2	0.199
Sable S	35	0.134	0.05	2	0.188	0.075	1	0.134
POP	67	0.168	0.05	2	0.230	0.075	1	0.168
Shortbelly	49	0.129	0.05	1	0.129	0.075	1	0.129
Widow	104	0.134	0.034	2	0.178	0.051	1	0.134
Canary	113	0.135	0.05	1	0.135	0.075	1	0.135
Chili	80	0.117	0.05	2	0.195	0.075	2	0.195
Bocaccio	72	0.066	0.05	2	0.130	0.075	0	0.000
Splitnose	78	0.131	0.05	1	0.131	0.075	1	0.131
Yellowtail	67	0.173	0.05	1	0.173	0.075	1	0.173
Shortspine C	105	0.142	0.031	3	0.211	0.047	1	0.142
Shortspine N	60	0.175	0.048	1	0.175	0.072	1	0.175
Shortspine S	65	0.103	0.047	2	0.176	0.071	2	0.176
Longspine C	89	0.155	0.02	4	0.246	0.03	2	0.194
Longspine N	88	0.155	0.02	4	0.246	0.03	2	0.194
Longspine S	9	0.250	0.05	1	0.250	0.075	1	0.250
Cowcod	10	0.125	0.05	2	0.250	0.075	2	0.250
Darkblotched	120	0.154	0.05	1	0.154	0.075	1	0.154
Yelloweye	86	0.111	0.05	1	0.111	0.075	1	0.111
Black RF C	40	0.187	0.05	4	0.376	0.075	2	0.267
Black RF WA	16	0.125	0.05	2	0.206	0.075	2	0.206
Black RF O-C	33	0.203	0.05	4	0.394	0.075	2	0.285
Minor RF N	123	0.154	0.05	1	0.154	0.075	1	0.154
MRN NS	20	0.231	0.05	2	0.354	0.075	2	0.354
MRN SH	118	0.145	0.04	2	0.195	0.06	1	0.145
MRN SL	74	0.154	0.05	1	0.154	0.075	1	0.154
Minor RF S	104	0.104	0.05	3	0.227	0.075	1	0.104
MRS NS	44	0.141	0.05	2	0.193	0.075	1	0.141
MRS SH	100	0.114	0.05	3	0.292	0.075	3	0.292
MRS SL	86	0.093	0.05	2	0.159	0.075	1	0.093
CA Scorp	15	0.063	0.05	3	0.186	0.075	0	0.000
Cabezon CA	13	0.083	0.05	1	0.083	0.075	1	0.083
Dover Sole	110	0.149	0.018	4	0.231	0.027	3	0.209
Eng Sole	122	0.166	0.1	1	0.166	0.15	1	0.166
Petrale C	143	0.142	0.029	3	0.223	0.044	2	0.190
Arrowtooth	55	0.140	0.05	2	0.241	0.075	2	0.241
Starry Fl	49	0.186	0.05	1	0.186	0.075	1	0.186
Other FF	142	0.125	0.1	2	0.228	0.15	0	0.000
Other GF	79	0.159	0.05	1	0.159	0.075	1	0.159

Table 49. Number of entities receiving allocations of total non-whiting groundfish above the option 3 control limits and amounts of QS over the limit, categorized by type of entity (comparison to control limit option 3 (max QS = 3%).

	QS Allocations to Harvesters / Buyers	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
1	**All eligible harvesting entities and buying entities**		
	Equal sharing of buyback		
	100% to Harvesters	2	0.09
	87.5% / 12.5%	2	0.13
	75% / 25%	2	0.17
	50% / 50%	3	0.33
	No equal sharing of buyback		
	100% to Harvesters	4	0.16
	87.5% / 12.5%	3	0.16
	75% / 25%	3	0.20
	50% / 50%	4	0.37
2	**Only entities that are buyers**		
	Equal sharing of buyback		
	100% to Harvesters	1	0.05
	87.5% / 12.5%	1	0.09
	75% / 25%	2	0.17
	50% / 50%	3	0.33
	No equal sharing of buyback		
	100% to Harvesters	1	0.05
	87.5% / 12.5%	1	0.10
	75% / 25%	3	0.20
	50% / 50%	4	0.37
3	**Only entities that are not buyers**		
	Equal sharing of buyback		
	100% to Harvesters	1	0.04
	87.5% / 12.5%	1	0.03
	75% / 25%	0	0.00
	50% / 50%	0	0.00
	No equal sharing of buyback		
	100% to Harvesters	3	0.11
	87.5% / 12.5%	2	0.06
	75% / 25%	0	0.00
	50% / 50%	0	0.00

Table 50 Number of permits and amounts of QS allocated to permits in excess of vessel limits (100% allocation to permits based on harvest history, no equal sharing of buyback history).

			Vessel Limit Option 1			Vessel Limit Option 2		
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	163	0.025	0.03	0	0.000	0.044	0	0.000
Ling C	155	0.035	0.1	0	0.000	0.15	0	0.000
Ling N	111	0.044	0.1	0	0.000	0.15	0	0.000
Ling S	95	0.069	0.1	0	0.000	0.15	0	0.000
Pcod	109	0.204	0.1	2	0.314	0.15	1	0.204
Pwhit_SN	73	0.147	0.075	3	0.322	0.113	1	0.147
Sable C	154	0.020	0.038	0	0.000	0.057	0	0.000
Sable N	152	0.021	0.062	0	0.000	0.093	0	0.000
Sable S	31	0.234	0.062	6	0.786	0.093	4	0.636
POP	126	0.050	0.062	0	0.000	0.093	0	0.000
Shortbelly	120	0.355	0.062	2	0.433	0.093	1	0.355
Widow	157	0.081	0.068	1	0.081	0.102	0	0.000
Canary	156	0.047	0.1	0	0.000	0.15	0	0.000
Chili	87	0.118	0.1	2	0.222	0.15	0	0.000
Bocaccio	73	0.151	0.1	1	0.151	0.15	1	0.151
Splitnose	77	0.120	0.1	1	0.120	0.15	0	0.000
Yellowtail	130	0.062	0.1	0	0.000	0.15	0	0.000
Shortspine C	149	0.021	0.062	0	0.000	0.093	0	0.000
Shortspine N	127	0.032	0.096	0	0.000	0.144	0	0.000
Shortspine S	101	0.047	0.094	0	0.000	0.141	0	0.000
Longspine C	148	0.018	0.04	0	0.000	0.06	0	0.000
Longspine N	148	0.018	0.04	0	0.000	0.06	0	0.000
Longspine S	1	1.000	0.1	1	1.000	0.15	1	1.000
Cowcod	1	1.000	0.1	1	1.000	0.15	1	1.000
Darkblotched	153	0.079	0.1	0	0.000	0.15	0	0.000
Yelloweye	145	0.089	0.1	0	0.000	0.15	0	0.000
Black RF C	80	0.151	0.1	1	0.151	0.15	1	0.151
Black RF WA	19	0.403	0.1	2	0.780	0.15	2	0.780
Black RF O-C	71	0.167	0.1	1	0.167	0.15	1	0.167
Minor RF N	153	0.032	0.1	0	0.000	0.15	0	0.000
MRN NS	50	0.308	0.1	1	0.308	0.15	1	0.308
MRN SH	153	0.044	0.08	0	0.000	0.12	0	0.000
MRN SL	128	0.038	0.1	0	0.000	0.15	0	0.000
Minor RF S	111	0.083	0.1	0	0.000	0.15	0	0.000
MRS NS	52	0.150	0.1	4	0.475	0.15	1	0.150
MRS SH	104	0.098	0.1	0	0.000	0.15	0	0.000
MRS SL	104	0.094	0.1	0	0.000	0.15	0	0.000
CA Scorp	2	0.673	0.1	2	1.000	0.15	2	1.000
Cabezon CA	2	0.620	0.1	2	1.000	0.15	2	1.000
Dover Sole	155	0.018	0.036	0	0.000	0.054	0	0.000
Eng Sole	154	0.054	0.2	0	0.000	0.3	0	0.000
Petrale C	156	0.028	0.058	0	0.000	0.087	0	0.000
Arrowtooth	129	0.130	0.1	2	0.240	0.15	0	0.000
Starry Fl	72	0.346	0.1	1	0.346	0.15	1	0.346
Other FF	156	0.135	0.2	0	0.000	0.3	0	0.000
Other GF	136	0.062	0.1	0	0.000	0.15	0	0.000

Table 51 Number of permits and amounts of QS allocated to permits in excess of vessel limits (75% allocated to permits based on harvest history, no equal sharing of buyback history)

			Vessel Limit Option 1			Vessel Limit Option 2		
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	163	0.02	0.03	0	0.000	0.04	0	0.000
Ling C	155	0.03	0.10	0	0.000	0.15	0	0.000
Ling N	111	0.03	0.10	0	0.000	0.15	0	0.000
Ling S	95	0.05	0.10	0	0.000	0.15	0	0.000
Pcod	109	0.15	0.10	1	0.153	0.15	1	0.153
Pwhit_SN	73	0.11	0.08	1	0.111	0.11	0	0.000
Sable C	154	0.02	0.04	0	0.000	0.06	0	0.000
Sable N	152	0.02	0.06	0	0.000	0.09	0	0.000
Sable S	31	0.18	0.06	5	0.541	0.09	3	0.398
POP	126	0.04	0.06	0	0.000	0.09	0	0.000
Shortbelly	120	0.27	0.06	1	0.267	0.09	1	0.267
Widow	157	0.06	0.07	0	0.000	0.10	0	0.000
Canary	156	0.04	0.10	0	0.000	0.15	0	0.000
Chili	87	0.09	0.10	0	0.000	0.15	0	0.000
Bocaccio	73	0.11	0.10	1	0.113	0.15	0	0.000
Splitnose	77	0.09	0.10	0	0.000	0.15	0	0.000
Yellowtail	130	0.05	0.10	0	0.000	0.15	0	0.000
Shortspine C	149	0.02	0.06	0	0.000	0.09	0	0.000
Shortspine N	127	0.02	0.10	0	0.000	0.14	0	0.000
Shortspine S	101	0.04	0.09	0	0.000	0.14	0	0.000
Longspine C	148	0.01	0.04	0	0.000	0.06	0	0.000
Longspine N	148	0.01	0.04	0	0.000	0.06	0	0.000
Longspine S	1	0.75	0.10	1	0.750	0.15	1	0.750
Cowcod	1	0.75	0.10	1	0.750	0.15	1	0.750
Darkblotched	153	0.06	0.10	0	0.000	0.15	0	0.000
Yelloweye	145	0.07	0.10	0	0.000	0.15	0	0.000
Black RF C	80	0.11	0.10	1	0.113	0.15	0	0.000
Black RF WA	19	0.30	0.10	2	0.585	0.15	2	0.585
Black RF O-C	71	0.13	0.10	1	0.125	0.15	0	0.000
Minor RF N	153	0.02	0.10	0	0.000	0.15	0	0.000
MRN NS	50	0.23	0.10	1	0.231	0.15	1	0.231
MRN SH	153	0.03	0.08	0	0.000	0.12	0	0.000
MRN SL	128	0.03	0.10	0	0.000	0.15	0	0.000
Minor RF S	111	0.06	0.10	0	0.000	0.15	0	0.000
MRS NS	52	0.11	0.10	1	0.113	0.15	0	0.000
MRS SH	104	0.07	0.10	0	0.000	0.15	0	0.000
MRS SL	104	0.07	0.10	0	0.000	0.15	0	0.000
CA Scorp	2	0.50	0.10	2	0.750	0.15	2	0.750
Cabezon CA	2	0.47	0.10	2	0.750	0.15	2	0.750
Dover Sole	155	0.01	0.04	0	0.000	0.05	0	0.000
Eng Sole	154	0.04	0.20	0	0.000	0.30	0	0.000
Petrale C	156	0.02	0.06	0	0.000	0.09	0	0.000
Arrowtooth	129	0.10	0.10	0	0.000	0.15	0	0.000
Starry Fl	72	0.26	0.10	1	0.260	0.15	1	0.260
Other FF	156	0.10	0.20	0	0.000	0.30	0	0.000
Other GF	136	0.05	0.10	0	0.000	0.15	0	0.000

Table 52 Number of permits and amounts of QS allocated to permits in excess of vessel limits (QS allocated 100% to permits based on harvest history + equal sharing of buyback history).

			Vessel Limit Option 1			Vessel Limit Option 2		
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	169	0.016	0.03	0	0.000	0.044	0	0.000
Ling C	169	0.022	0.1	0	0.000	0.15	0	0.000
Ling N	169	0.026	0.1	0	0.000	0.15	0	0.000
Ling S	169	0.044	0.1	0	0.000	0.15	0	0.000
Pcod	169	0.100	0.1	1	0.100	0.15	0	0.000
Pwhit_SN	169	0.087	0.075	1	0.087	0.113	0	0.000
Sable C	169	0.014	0.038	0	0.000	0.057	0	0.000
Sable N	169	0.014	0.062	0	0.000	0.093	0	0.000
Sable S	169	0.150	0.062	4	0.411	0.093	3	0.342
POP	169	0.030	0.062	0	0.000	0.093	0	0.000
Shortbelly	169	0.195	0.062	1	0.195	0.093	1	0.195
Widow	169	0.054	0.068	0	0.000	0.102	0	0.000
Canary	169	0.028	0.1	0	0.000	0.15	0	0.000
Chili	169	0.096	0.1	0	0.000	0.15	0	0.000
Bocaccio	169	0.124	0.1	1	0.124	0.15	0	0.000
Splitnose	169	0.092	0.1	0	0.000	0.15	0	0.000
Yellowtail	169	0.037	0.1	0	0.000	0.15	0	0.000
Shortspine C	169	0.014	0.062	0	0.000	0.093	0	0.000
Shortspine N	169	0.019	0.096	0	0.000	0.144	0	0.000
Shortspine S	169	0.033	0.094	0	0.000	0.141	0	0.000
Longspine C	169	0.013	0.04	0	0.000	0.06	0	0.000
Longspine N	169	0.013	0.04	0	0.000	0.06	0	0.000
Longspine S	169	0.646	0.1	1	0.646	0.15	1	0.646
Cowcod	169	0.444	0.1	1	0.444	0.15	1	0.444
Darkblotched	169	0.044	0.1	0	0.000	0.15	0	0.000
Yelloweye	169	0.060	0.1	0	0.000	0.15	0	0.000
Black RF C	169	0.117	0.1	1	0.117	0.15	0	0.000
Black RF WA	169	0.135	0.1	2	0.262	0.15	0	0.000
Black RF O-C	169	0.139	0.1	1	0.139	0.15	0	0.000
Minor RF N	169	0.020	0.1	0	0.000	0.15	0	0.000
MRN NS	169	0.128	0.1	1	0.128	0.15	0	0.000
MRN SH	169	0.026	0.08	0	0.000	0.12	0	0.000
MRN SL	169	0.024	0.1	0	0.000	0.15	0	0.000
Minor RF S	169	0.059	0.1	0	0.000	0.15	0	0.000
MRS NS	169	0.109	0.1	1	0.109	0.15	0	0.000
MRS SH	169	0.075	0.1	0	0.000	0.15	0	0.000
MRS SL	169	0.064	0.1	0	0.000	0.15	0	0.000
CA Scorp	169	0.632	0.1	2	0.939	0.15	2	0.939
Cabezon CA	169	0.595	0.1	2	0.959	0.15	2	0.959
Dover Sole	169	0.013	0.036	0	0.000	0.054	0	0.000
Eng Sole	169	0.035	0.2	0	0.000	0.3	0	0.000
Petrale C	169	0.017	0.058	0	0.000	0.087	0	0.000
Arrowtooth	169	0.062	0.1	0	0.000	0.15	0	0.000
Starry Fl	169	0.305	0.1	1	0.305	0.15	1	0.305
Other FF	169	0.092	0.2	0	0.000	0.3	0	0.000
Other GF	169	0.039	0.1	0	0.000	0.15	0	0.000

Table 53 Number of permits and amounts of QS allocated to permits in excess of vessel limits (QS allocated 75% to permits based on harvest history + equal sharing of buyback history)

			Vessel Limit Option 1			Vessel Limit Option 2		
	# entities receiving QS	MAX QS Alloc.	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
NWGF	169	0.012	0.03	0	0.000	0.044	0	0.000
Ling C	169	0.016	0.1	0	0.000	0.15	0	0.000
Ling N	169	0.020	0.1	0	0.000	0.15	0	0.000
Ling S	169	0.033	0.1	0	0.000	0.15	0	0.000
Pcod	169	0.075	0.1	0	0.000	0.15	0	0.000
Pwhit_SN	169	0.065	0.075	0	0.000	0.113	0	0.000
Sable C	169	0.010	0.038	0	0.000	0.057	0	0.000
Sable N	169	0.010	0.062	0	0.000	0.093	0	0.000
Sable S	169	0.113	0.062	3	0.257	0.093	1	0.113
POP	169	0.022	0.062	0	0.000	0.093	0	0.000
Shortbelly	169	0.146	0.062	1	0.146	0.093	1	0.146
Widow	169	0.040	0.068	0	0.000	0.102	0	0.000
Canary	169	0.021	0.1	0	0.000	0.15	0	0.000
Chili	169	0.072	0.1	0	0.000	0.15	0	0.000
Bocaccio	169	0.093	0.1	0	0.000	0.15	0	0.000
Splitnose	169	0.069	0.1	0	0.000	0.15	0	0.000
Yellowtail	169	0.028	0.1	0	0.000	0.15	0	0.000
Shortspine C	169	0.010	0.062	0	0.000	0.093	0	0.000
Shortspine N	169	0.014	0.096	0	0.000	0.144	0	0.000
Shortspine S	169	0.025	0.094	0	0.000	0.141	0	0.000
Longspine C	169	0.009	0.04	0	0.000	0.06	0	0.000
Longspine N	169	0.009	0.04	0	0.000	0.06	0	0.000
Longspine S	169	0.484	0.1	1	0.484	0.15	1	0.484
Cowcod	169	0.333	0.1	1	0.333	0.15	1	0.333
Darkblotched	169	0.033	0.1	0	0.000	0.15	0	0.000
Yelloweye	169	0.045	0.1	0	0.000	0.15	0	0.000
Black RF C	169	0.088	0.1	0	0.000	0.15	0	0.000
Black RF WA	169	0.101	0.1	1	0.101	0.15	0	0.000
Black RF O-C	169	0.104	0.1	1	0.104	0.15	0	0.000
Minor RF N	169	0.015	0.1	0	0.000	0.15	0	0.000
MRN NS	169	0.096	0.1	0	0.000	0.15	0	0.000
MRN SH	169	0.020	0.08	0	0.000	0.12	0	0.000
MRN SL	169	0.018	0.1	0	0.000	0.15	0	0.000
Minor RF S	169	0.044	0.1	0	0.000	0.15	0	0.000
MRS NS	169	0.082	0.1	0	0.000	0.15	0	0.000
MRS SH	169	0.056	0.1	0	0.000	0.15	0	0.000
MRS SL	169	0.048	0.1	0	0.000	0.15	0	0.000
CA Scorp	169	0.474	0.1	2	0.704	0.15	2	0.704
Cabezon CA	169	0.446	0.1	2	0.720	0.15	2	0.720
Dover Sole	169	0.009	0.036	0	0.000	0.054	0	0.000
Eng Sole	169	0.026	0.2	0	0.000	0.3	0	0.000
Petrale C	169	0.013	0.058	0	0.000	0.087	0	0.000
Arrowtooth	169	0.047	0.1	0	0.000	0.15	0	0.000
Starry Fl	169	0.229	0.1	1	0.229	0.15	1	0.229
Other FF	169	0.069	0.2	0	0.000	0.3	0	0.000
Other GF	169	0.029	0.1	0	0.000	0.15	0	0.000

Table 54. Number of permits and amounts of QS allocated to permits in excess of vessel limits (Whiting QS allocated 100% to permits).

	# entities receiving QS	MAX QS Alloc.	Vessel Limit Option 1 Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Vessel Limit Option 2 Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit	Vessel Limit Option 3 Limit	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit
Equal sharing of buyback history											
Shorebased	169	0.046615	0.075	-	-	0.113	-	-	0.12	-	-
At Sea CV-MS	169	0.095748	0.25	-	-	0.375	-	-	0.5	-	-
No equal sharing of buyback history											
Shorebased	59	0.050029	0.075	-	-	0.113	-	-	0.12	-	-
At Sea CV-MS	32	0.101767	0.25	-	-	0.375	-	-	0.5	-	-
CP	10	0.235539	0.65	-	-	0.70	-	-	0.75	-	-

A-2.4 Additional Measures for Processors

Provisions and Options

Option 1: Any QS received for processing history as part of the initial allocation will expire after a certain period of time (to be determined prior to final Council action). At that time all remaining QS will be adjusted proportionally so that the total is 100%.
Option 2: The accumulation limit grandfather clause of Section A-2.2.3.e will not apply for processing history. Regardless of the percent of the total QS designated for processors, processing history will not entitle a person to receive QS in excess of the accumulation limits.
Option 3: The Adaptive Management allocation and process (Section A-3) will be used to compensate processors for demonstrated harm by providing QP to be directed in a fashion that increases benefits for affected processors.

Rationale and Options Considered but not Analyzed Further

These options are being considered as possible ways to address processor concerns short of a full allocation of QS to processors. In section A-2.1.1.a we focused on reasons for allocating or not allocating to all groups. The focus of this section is on the rationale for allocating to processors and additional measure that might be adopted in addition to or in lieu of an allocation to processors. In the spring of 2007 we compiled and received public comment on a list of the reasons provided for allocating and not allocating to processors. Since the focus of this section is specifically on the allocation to processors, we provide a summary of that compilation here.

Reasons to Allocate to Processors	Reasons Given for Not Allocating to Processors
Compensation for stranded capital	Stranded capital will not occur for processors. Long-term compensation should not be given for a short term problem.
Processors are fishery participants that are invested and dependent on the fishery (303A) and have made contributions to the development of the fishery.	National Standard 4 says allocations, when necessary, should be to “fishermen.” No precedence for allocating IFQ to processors
Keep balance of market power and flow of product to existing plants	Will create a market power imbalance.
Facilitate communication and coordination of fishing activity between plants and vessels, including management of total harvest, bycatch, and participation among co-ops.	Such communication and coordination occurs under status quo and processors do not need an initial allocation to continue. If processors do not receive an initial allocation they can still participate in co-ops by acquiring QS in the market place.
There is a conservation benefit whether you give QS to permit holders or processors.	Degrades conservation benefit.
Maintain diversity and competition in the processing sector.	The processing sector will be consolidated and new entry will become more difficult.
Processor buy-in is needed to move the program forward.	
	Consolidation among permit holders not associated with processors will increase.
	An allocation to processors does not take into account the permit owner’s obligation to repay loans from the buyback program. Those loans bought up permits representing nearly 50% of the fleets catch history.

Limited Duration QS. Option 1 would provide processors with QS for a limited period of time. Under the Amendment 6 program, limited duration permits ("B" permits) were issued to provide an adjustment period for those to whom "A" permits were not granted. One reason limited duration QS might be considered would be if the primary rationale for granting QS to processors is the concern that QS holders may capture a portion of processor profits. This may be a possibility if processors are overcapitalized, the processing side of the market is structured competitively and QS holders are able to exert market power. The period of time might be set such that it is believed excess capital will have left the fishery when the QS expire or that any processor who had taken out loans to finance their investment would be able to pay that investment back. Holding QS for that period would provide leverage in the market place while the QS is active.

No Grandfather Clause. Option 2 would place caps on the amount of QS a processor receives at the time of initial allocation. It is relevant only if the Council adopts a grandfather clause as part of the accumulation limit option. This option might be adopted to pursue at least two different ends

(1) to provide another balance the Council could strike in trying to establish the appropriate distribution of QS between processors and harvesters, and
(2) to alter the balance of program impacts between small and large processors (independent of issues related to the harvester/buyer split of the initial allocation).

This option would provide more QS to smaller processors and less to larger processors and not affect the split between harvesters and processors (assuming that the intent of the option is to preserve the split of QS between harvesters and processors established in section A.2.1.1.a, e.g. a 75/25 split).[41] Part of the rationale for a grandfather clause for harvesters is that they must have QP to operate and a grandfather clause allows them to achieve certain historic scales of operation. Processors do not need the grandfather clause to preserve their historic scale of operation because they do not need to hold QP to buy groundfish. The grandfather clause is needed for historic scale of operations with respect to processor owned permits, however, this option is phrased such that QS allocations issued for processor owned permits would still be grandfathered in.

Adaptive Management. Option 3, like Option 1, is focused primarily on the issue of compensation for harm to processors. Option 3 would establish that it is the Council's specific intent to use the adaptive management program for the purpose of compensating processors for harm. The adaptive management program itself (Section A-3) leaves this open as a possibility but does not commit the Council to that course of action. Under Option 3 no special action would be taken to benefit processors until after such harm has been identified. At that time, the Council would have to decide if the holdback program will be used to benefit all processors, a certain class of processors, or just those specific entities that demonstrate they have been harmed by the program.

The following option was considered but rejected.

> As needed, a fee will be established to provide financial compensation to processors for demonstrated harm. A process will be established for the demonstration of harm.

Establishing the fee and using it to provide direct financial compensation would require Congressional action.

[41] An alternative interpretation of this option could be that any QS that is not issued to a processor because it exceeds the accumulation limit would be distributed as part of the initial allocation to QS holders.

Interlinked Elements

Depending on the rationale for considering these options, each of these may be linked with the decision on the amount of QS allocation to give to buyers (processors) as part of the initial allocation (Section A-2.1.1.c).

Options 1 and 2 are interlinked with the accumulation limit decision on whether or not to include a grandfather clause. Option 2 only makes sense if such a clause is provided in Section A-2.2.3.e. Option 1 in particular would require some additional considerations with respect to specification of the grandfather clause. Specifically when the QS issued to processors expires and the result is that all other QS increase proportionally, are those who control QS allowed to keep the additional QS they receive that is in excess of the accumulation limits? If there is a vessel grandfather clause, will the grandfathered levels for vessels be increased.

Option 3 of this section would apply to relatively few processors if adopted in conjunction with Option 5 of Section A-2.1.1.a (Option 5 allocated to processors and specifies a set aside for the adaptive management program). Section A-3.0 covers the adaptive management program. A-3.0 specifies that if the Council were to allocate QS to processors (adopt Option 5 in Section A-2.1.1.a) those processors who receive an initial allocation would not be eligible to receive QP issued through the adaptive management program. Option 3 of this section allocates only to those processors able to demonstrate harm. Presumably, in order to demonstrate harm from an IFQ Program, the processor would have to exist at time of program implementation. Since most processors would receive an initial allocation the only processors eligible for QS under Option 3 would be those that had entered the program relatively recently (i.e. after 2003) or are pre-existing but did not meet the recent participation criteria of Section A-2.1.2.

Analysis

These options impact goals and objectives related to net benefits and efficiency, disruption, excessive shares, fairness and equity, and sector health. The impacts will be reviewed here in the context of the effect of the options on processors and harvesters. There may be some indirect impacts to communities and labor related to the amount and duration of the QS issued to processors or the distribution of QP under adaptive management. These impacts are discussed in Section A.2.1.1.a and A-3. Whether communities are benefited more by a provision that benefits harvesters or one that provides more benefits to processors depends in part on the degree to which each of these entities tends to be tied to communities.

Limited Duration QS (Option 1)

❖ **Impacts on Processors**

One of the rationales for allocation to processors is that during the post implementation transition period, those who hold QS will be able to capture profits from the harvesters or processors that would otherwise go to a return on investment and possibly repayment of debt. In Section A-2.1.1-a we identified that the opportunity for QS holders to capture such profits would be limited to the time period and sectors for which overcapitalization exists. Further, we identified that the ability to capture profits from a sector depends on price based market competition within the sector; and finally, that if the price based market competition existed prior to implementation of the IFQ program a firm’s profits should not vary substantially from what is observed under status quo. If there are profits that exist under status quo that may be captured by QS holders (for example, because some competition under status quo was based on ability to handle product volume during an Olympic fishery) that ability to capture such profits should be limited to the time period during which overcapitalization remains in the sector. Thus whether this measure would address the concern about capture of processor profits by QS holders will depend on when QS issued to processors are set to expire, the time period over which the processors capture adequate return on capital and the time period required to repay debt on the capital investment.

With respect to the difference between capturing adequate return and paying off debt, adequate return is that return necessary to compensate the owners of capital for their investment and should be comparable to the return for investments of similar levels of risk in other sectors of the economy. When such compensation is not available, it discourages future investments in the sector. Adequate return should be taken into account whether the capital investment is financed through the firm's own assets (e.g. cash on hand) or through a bank loan. The time period required to cover debt is an important consideration with respect to the effect of the IFQ program on financial stress and potential bankruptcies. We believe that banks generally require that most fishery specific equipment investments be paid off within 5-10 years. This needs to be reconfirmed.

Another reason for providing QS to processors is to affect the balance of market power in the fishery. Those initially holding QS will receive resource rents and be in a better position to thwart an attempt by those on the opposite side of the market to exert market power. If processors are given QS over concern about harvesters' ability to exert market power, limiting the duration of the QS will cut short the achievement of this objective. It would provide processors a grace period during which they might be in a better position to maintain their profits (assuming that harvesters would otherwise exert market power) and that period could provide an opportunity for them to acquire QS from harvesters (QS that will not expire). At the start of the program, the QS available from harvesters will be somewhat less expensive relative to their value after the QS issued to processors expires. At the same time, those holding the QS may be more reluctant to part with them because they know their value will increase substantially as the time at which the QS issued to processors approaches. Additionally, an initial moratorium on the transfer of QS (an option in Section A-2.2.3.c) would also make it more difficult to accumulate QS.

An initial allocation of QS will provide an infusion of wealth to the initial recipients which may give them a leg up in the growth and expansion of their operations, including the accumulation of additional QS (see Section A-2.1.1.a). If the intent of an initial allocation to processors is to also provide them with this advantage, or an advantage more on a par with harvesters, that advantage will be substantially decreased if the QS are set to expire after a certain period.

The initial allocation will also create a competitive advantage for existing businesses *vis a vis* new entrants (a barrier to new entry, see Section A-2.1.1.a). Sectors are able to exert market power over the long run only to the degree that a barrier to entry prevents the entry of new competitors attracted by higher profits. Limiting the duration of the initial allocation will reduce this affect.

❖ Impacts on Harvesters

If processor QS is to expire after a period of time and all QS that was originally issued to harvesters expanded, the expiration will cause a price fluctuation and there will be a second transition period. The effect of the expiration on price fluctuation and QS availability on the market is described above in the section on processors. After QS are issued it is expected that the individual quota will migrate into the hands of the most efficient producers (whether as QS they own or as QP they acquire from other QS holders). It is, however, likely that the initial distribution will affect the vessels to which the QS/QP migrates. The QS issued to permit owners will likely migrate through the market to the most efficient vessels, some of which may be owned by harvesters and others by entities that also process.[42] Processors may be more likely to use QS on their own vessels (taking advantage of vertical integration opportunities) and accumulate additional QS to make those vessels more efficient;[43] or they may decide it is more efficient to not operate vessels but rather to use the QS they own to influence deliveries of independently operated vessels. Depending on this choice, the rationalization process may leave a different set of active vessels. However, either way, if a substantial degree of rationalization is achieved within the "lifespan" of the limited duration QS, once those limited duration QS expire some vessels may find themselves with excessive amounts of QS and others with less than they need. Vessels owners may use a variety of contracting mechanisms in order to arrange in advance to minimize the disruptive effects of the second transition period. However, this will require additional transaction costs, and advance contracting by owners at or close to their accumulation limits may be difficult.

❖ Impacts on Net Economic Benefits

The need to track QS originally issued to processors separately from other QS will add some cost to the QS tracking program. The second adjustment period occurring when limited duration endorsements expire will also have an effect on net benefits by increasing transaction costs as QS owners prepare for the repositioning required by the expiration.

No Grandfather Clause (Option 2)

❖ Impacts on Processors

This grandfather clause would not affect any QS issued to a processor based on the history of a limited entry permits owned by that processor. However, a processor that receives for its limited entry permits an amount of QS in excess of the accumulation limits will not be eligible to receive QS for its processing history. QS it would have otherwise received will be redistributed to the remaining processors in accordance with the allocation formula. Thus, excluding processors from the grandfather clause provision will even the distribution of QS among processors. This effect has been discussed in Section A-2.1.1.a.

Some of the smaller processors will be relatively better off in that they will have more QS and thus potentially more bargaining power in their interaction with harvesters. Relative to larger processors they are likely to have greater strength, as compared to what they would have had if there had been a grandfather clause.

❖ Impacts on Harvesters

As compared to a processor allocation in which a grandfather clause applied to processors, harvesters are more likely to face a buying sector that has a greater number of buyers and smaller buyers with relatively more bargaining power.

If smaller processors are less likely to own their own permits or vessels than larger processors, then a redistribution of QS issued to processors that is skewed more toward smaller processors is more likely to

[42] In some cases it will be the QP that migrates while initial recipients retain ownership of QS.
[43] Up to accumulation limits.

result in consolidation of QP on vessels that are harvester owned rather than those that are processor owned.

❖ Impacts on Net Economic Benefits

The impact of Option 2 on net benefits relative to a processor allocation without a cap on the accumulation limit is uncertain and likely depends on whether there would be a change in the transaction costs necessary to get QP into vessel accounts and whether there would be any greater or lesser reason to expect that market competition will be hampered. As compared to Options 1 and Options 3 the transition/implementing costs are lower.

Adaptive Management (Option 3)

❖ Impacts on Processors

Under Option 3, QP issued through the adaptive management program would be used to compensate processors for demonstrated harm. If adopted, the exact impacts of this provision will depend on the process by which the provision is activated and how the QP issued for this purpose are distributed.

With respect to activation of the provision, the first step is demonstration of harm. If prior to implementation of the IFQ program there is no further development of this option, there would be several implicit lags in its activation. First, the harm would have to be identified and someone, the industry or government, would have to collect the information and provide it in a Council forum. The Council would then develop criteria for evaluating the information and harm, conduct the evaluation, identify a remedy and complete the Council decision process, at which time NMFS would evaluate the Council recommendation and take appropriate action. Alternatively, the matter of developing criteria, evaluating the harm, and determining a remedy could be delegated to NMFS discretion. In either case, the action would require a public process. The first QP would be issued in the year following completion of that process.

On the one hand leaving the program completely open with respect to criteria and response provides the maximum flexibility for appropriate adaptive management. On the other hand, that flexibility results in a time lag for taking action. Depending on the length of that lag and the degree of harm, processing companies could go out of business prior to remedial action.

Alternatively, some criteria and remedial actions might be developed in advance so they are ready to support a rapid initial response. This would not prevent the Council from augmenting or revising the criteria and response to be more targeted with respect to the circumstances which eventually present themselves. The Council could even start the program with remedial actions in place that would sunset after a certain transition period. For example, the potential for a market power imbalance in favor of harvesters might be addressed by issuing adaptive management QP directly to processors for the transition period. This would differ from Option 1 in that processors would not have QS to trade. The QP allocation might be based on the processor share of the total deliveries in the previous year.[44] Using another approach, some stability and power could be given to processors simply by issuing the adaptive management QP to a vessel for whatever portion of the vessel's coming year's harvest it commits to

[44] In such a case, the adaptive management QP might be issued part way through the fishing year (after completion of the accounting for the previous year's harvest). For example, a condition of the program might be that the QP issuance would occur March 1 based on all fish tickets turned in by January 15.

delivering to the same processor that it did in the previous year. This would provide a disincentive for moving between processors in the same way that the requirement to spend a year in the "non-co-op" portion of the fishery provides a disincentive for moving between processors in the co-op alternative. However, in this case the disincentive would be an effective reduction in the total QP available to a harvester. The additional leverage for a processor would be limited because while the harvester moving to a different processor retains the QP it would have otherwise had, for example 90% of its QP, the processor would be left with no production from that vessel. Nevertheless, this approach would be similar to the Groundfish Development Program used in the BC trawl IFQ program that has been viewed to be relatively successful in providing some stability for processors. Another approach that has been suggested is that QP might be given to harvesters based on their entry into a preseason contract. This could provide processors some single year stability through planning opportunity but it is not clear how it would affect longer term stability and market power. Pressure would be on both the harvesters and processors to enter into the preseason contract in order to gain the advantage of the adaptive management QP but it is the harvesters that would be able to shop that QP around and gain the best terms. A processor that did not agree to the harvester's price would be left with nothing and would face a market in which there are few QP available because of the preseason contracts to which other harvesters had committed themselves.

Option 3 of this section and Option 5 of A-2.1.1.a (Option 5 allocates QS to processors and provides for an adaptive management program) could both be adopted, but in that case the only processors able to benefit from Option 3 of this section would be those entering the fishery after 2003, or those disqualified by a recent participation criteria (Section A-2.1.2). This is because the adaptive management program (A-3) prohibits allocation of QP to processors that received an initial allocation.

❖ Impacts on Harvesters

As with the processors, the impact on harvesters will depend on how the program is implemented. If adaptive management QP are issued to processors, depending on the criteria for usage, it may be more likely that a processor will use the QP on its own vessel rather than an independent harvester. This would cause a direct disruption in the flow of QP among vessels, however, by definition the adaptive management program will likely either alter product flow or the prices at which raw fish are sold. While issuing QP to processors for use in balancing bargaining power might alter product flow among harvesters, issuing QP to harvesters as a reward for delivering to the same processors that they had in the previous year would stabilize product flow. Issuing the QP to harvesters in this fashion would also stabilize the rationalization process. Alternatively, if the fleet rationalizes, adjusting operation sizes to QS holdings, and then QP is diverted for use to compensate for processor harm and not available to the same harvesters (e.g. processors receive the QP want to use it on their own vessels) then harvesters would go through another adjustment phase.

❖ Impacts on Net Economic Benefits

There will be some management costs associated with the adaptive management program and depending on how it is implemented there may be some additional transaction costs if the QP available to particular harvesters are reduced and they need to make adjustments to their QS holdings in order to re-optimize.

In general, imposing a restriction on a properly functioning market system results in some inefficiency. However, if market power is being exerted and adaptive management is used to counter that effect, the effect on efficiency may be minimal. It might be possible to distribute the QP in such a way as to change the balance of market power, essentially redistributing the profits without changing who harvests and processes the fish. If this end is achieved, the effect on efficiency would be less than if the program resulted in an actual redistribution of the product flow. In order for the distribution to redistribute profits without redistributing the flow, it would be the threat of the potential redistribution that causes a different outcome in the bargaining process, rather than an actual shift.

APPENDIX A: LIST OF REFERENCES

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APPENDIX B
PRELIMINARY ANALYSIS OF SELECT COOP DESIGN COMPONENTS

A CONDENSED OVERVIEW OF HARVEST COOPERATIVES

A cooperative is used to describe a collective arrangement among a like-minded group of individuals. Cooperatives are entities that are controlled by the people who use them. They differ from other business entities because they are member owned and operate for the benefit of members. The general activity of cooperatives being considered under the council's rationalization program is the harvest of fish, so these types of cooperatives are best described as "harvest cooperatives" and a harvest cooperative can be defined as an entity which acts to coordinate the harvest of its members. The council is considering harvest cooperatives that would have a privilege to harvest a share of the allowable catch.

Harvest cooperatives are organizations made up of vessels that work together to harvest a fishery resource. These organizations are sometimes made up of several vessels that negotiate catch sharing arrangements among themselves without needing agency involvement. Other times these organizations are created by several vessels with catch history assignments (a percentage of allowable catch) that each vessel brings to the cooperative organization. This catch history can be leased to another vessel in the same cooperative through a private agreement without needing agency involvement. The administration and enforcement of harvest activities among member vessels is primarily done through the cooperative organizations and through private contracts. The regulatory activities of the agency that pertain to inseason harvest levels are generally limited to monitoring for sector or coop catch levels and closing when a sector or coop reaches their allocation.

The first example of a harvest cooperative already exists on the West Coast. The Pacific Whiting Conservation Coop is a voluntary association of catcher-processors that have negotiated catch sharing arrangements among themselves without agency and council involvement. The necessary ingredient for this cooperative to form is an allocation of whiting to the sector and a barrier to entry by other catcher-processors that are not part of the arrangement. The mothership and shorebased cooperative proposals are similar to the second example. In the mothership and shoreside proposal, each catcher vessel permit would have a percentage of the allowable catch based on their catch history and those catcher vessels would form cooperative arrangements with other catcher vessels. The cooperative organization would coordinate harvest activities of its member vessels and these activities would include leasing of shares between member vessels without agency involvement.

The primary difference between the two examples is the assignment of catch history. In cooperative programs with a relatively diverse set of harvesters, catch history assignments may be necessary in order to solve the allocation disputes that may arise between vessels over catch sharing. In cooperative programs with harvesters that are less diverse, catch history assignments may not be necessary because each vessel has relatively similar historic participation in the fishery, relatively similar historic catch levels, and find it relatively easy to reach catch sharing arrangements.

In some cooperative programs, catch history assigned to each vessel is linked to a processing entity. This linkage provision can trace its roots to the American Fisheries Act (AFA) which rationalized the Bering Sea Pollock fishery. The American Fisheries Act cooperatives were designed to "ensure that both harvesters and processors benefited from rationalization" {Stevens and Gorton, 1999 in Matulich, 2000} and one outcome was to establish a partial link between catcher vessels and shoreside processors. Catcher vessels and mothership processors are not linked in the Pollock fishery. Binding a vessel to a processor creates a system that takes on many characteristics of a vertically integrated firm. Harvesters cannot operate without a simultaneous act on the part of a processor and vice versa. With a harvester-processor linkage provision, harvesting entities and processing entities must negotiate with one another, and each are in a similarly powerful negotiating position. Neither the processing entity nor the harvesting entity can operate independent of the other, and therefore the goals of both entities become aligned, out of necessity. Furthermore, this type of mutual dependence places both entities in a relatively strong negotiation stance resulting in the sharing of profits that accrue as a result of harvesting and processing activity.

Although harvesters and processors have been linked in harvest cooperative programs, that linkage can be broken. In the existing cooperative alternatives, harvesters can beak the linkage by electing to fish in a non-cooperative fishery that is designed as a derby fishery. Harvesters in this non-cooperative fishery compete with one another for the catch allotted to the non-coop, and the non-coop is closed when the allowable non-coop catch is attained. The reason for including a non-cooperative portion of the fishery is because it makes the cooperatives and the linkages to processors that may exist in those systems voluntary to varying degrees. Harvesters may elect to not participate in a cooperative and deliver to any processor as long as the harvester remains in the non-coop fishery. Structuring the non-coop as a derby is intentional. This manner of fishing has proven to be less beneficial to participants in a fishery economically, thereby providing an incentive for harvesters to remain in a cooperative.

Requiring that a catcher vessel switch processors by fishing in the non-cooperative fishery is somewhat different from what occurs in the Bering Sea Pollock fishery. In the shoreside Pollock fishery, catcher vessels can switch processors without going into the non-cooperative fishery because only part of a vessel's catch history is linked. A vessel can "lease" it's linked catch history to other vessels in a cooperative, in turn "lease" the unlinked portion of the catch history from other catcher vessels in that cooperative and fish for any processor. If the majority of that vessel's deliveries are made to another processor, then a new processor linkage is established without the catcher vessel ever leaving the cooperative. As written, the existing MS and SS coops would require that vessels switching processors participate in the non-coop fishery.

B-1 WHITING SECTOR MANAGEMENT UNDER CO-OPS

All catcher-vessels have a choice of whether to participate in a co-op or non-cooperative portion of the fishery. For catcher-processors, no formal co-op fishery would be established but rather a closed class would be established and a vessel could, at its option, decide not to participate in a co-op with other members of that fishery. The structure of the catcher-processor cooperative alternative creates a framework for maintaining the existing voluntary cooperative

The existing allocation of whiting between the shoreside whiting, mothership, and CP sectors will remain under this alternative (42%, 24%, and 34%, respectively). Within each sector, this allowable catch will be assigned each year to co-ops or to the non-co-op portion of the fishery. Co-ops will then be responsible for monitoring and enforcing the catch of the organization and of co-op members, and NMFS will monitor the catch of each sector and in the non-co-op fishery, as well as the overall catch by all three sectors. NMFS will make the following closures if limits are reached: close a co-op fishery if co-ops have collectively reached their limit; close the non-co-op fishery if it reaches its limit; and/or close the combined co-op and non-co-op fishery if that whiting sector reaches its limit.

Provisions also will address the catch of overfished species and salmon in the whiting fishery. For overfished species, the Council is considering whether or not to make bycatch limits apply to the entire whiting fishery, individual whiting sectors, or to individual cooperatives. NMFS may close the whiting fishery, whiting sectors, or cooperatives, if a bycatch limit is reached.

B-1.1 Whiting Management

Catcher vessels in the mothership and shoreside sectors would receive a non-divisible "catch history[1]" designation as well as a sector endorsement which assigns that permit to either the shoreside or mothership sector. The whiting catch history for each catcher-vessel permit will be assigned to a co-op where it is pooled with the catch history of other permits in that co-op, or assigned to the non-coop fishery where it is pooled with other permits in the non-co-op fishery. The amount of catch each vessel in a cooperative can access may be the same as the catch history they bring to the cooperative, or it may be different if arrangements are made among cooperative members for leasing catch history. In the absence of a leasing arrangement, the "golden rule" applies where a vessel has access to the catch history that is associated with that permit. This "golden rule" provision is intended to solve resource sharing arrangements for the cooperative in case members cannot agree to sharing arrangements among themselves. If sharing arrangements are not decided, there is some risk of the cooperative de-stabilizing, and therefore, in the absence of any agreed upon sharing arrangement, each vessel has access to its own catch history.

Co-ops are responsible for monitoring and enforcing the catch limits of co-op members. Co-op members may lease their catch-history to another co-op member through private agreement without agency involvement. NMFS will monitor the catch in the non-co-op fishery, the co-op fisheries and the overall catch of all three sectors and close individual co-ops or sectors when their catch limits have been reached.

Inter-cooperative agreements can be established for sharing bycatch or whiting harvest opportunities across cooperatives. Inter-cooperative agreements can be constructed to transfer catch history of whiting if one cooperative finds that it will not catch the rest of its available whiting and another cooperative has an interest in doing so. Inter-cooperative transfers of bycatch can also occur if one cooperative finds it needs more bycatch than another. The result of inter-cooperative bycatch agreements may lead to more "risk sharing" of bycatch species across fishery participants. Inter-cooperative agreements can also be used by cooperatives to cover catch deficits if one cooperative has harvested more than its available catch history and another cooperative has catch history available. If an inter-cooperative agreement is formed between two cooperatives, NMFS will monitor the two cooperatives as one and close both cooperatives when the collective catch limit has been reached.

B-1.2 Annual Whiting Rollovers

A rollover provision provides a mechanism for the Pacific whiting fishery OY to be fully taken if one or more directed whiting sectors does not intend to harvest their full allocation. Rolling over a sector's allocation to another grants access to harvestable surplus that otherwise may be foregone if such a rollover does not occur and a sector does not intend to harvest their entire allocation. Under status quo conditions, this action occurs if NMFS is able to determine that one sector does not intend to harvest their full allocation. Upon such a determination, NMFS reapportions the unused amount of whiting to a sector that is still active in the fishery. In a cooperative program, the rollover of one sector's whiting to another is likely to require that NMFS calculate the available catch that is to be allocated to each cooperative in the sector that is the recipient of the rollover. This is an additional administrative step above that which occurs under status quo.

Not having a rollover provision from one sector to another is a change from status quo. Not allowing a rollover may mean that the available harvest is not realized in some years, potentially reducing economic

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[1] "Catch history" is a term used to describe a share of the allowable catch. The term "quota share" is not used in the cooperative analysis because quota share is divisible down to a single pound or percentage, while catch history is not divisible.

activity from what would otherwise be expected. In particular, if one sector is closed prematurely because of attainment of a bycatch limit, there is the possibility that substantial whiting may go un-harvested if there is no roll-over provision.

B-1.3 Bycatch Species Management

Bycatch Subdivision

Bycatch limits in a cooperative program are put in place as a catch management tool in order to prevent exceedance of ABCs and OYs, and also to prevent harm to other fishery sectors that may be impacted by higher than expected catch amounts of bycatch species. Managing a cooperative-based fishery with bycatch limits can be done in several ways. Such management may mean the specification of a bycatch limit that is common to the entire directed whiting fishery, a bycatch limit that is specific to each sector, a bycatch limit that is specific to each sector but divides each sector's limit between the cooperatives (a common limit for all cooperatives in a sector) and the non-cooperative portion of each sector, and a bycatch limit that is applied to each cooperative[2] and to the non-cooperative portion of the fishery.

Although bycatch limits are a catch management tool, the application of bycatch limits in the whiting fishery introduces several risk considerations. Empirical information has shown that for several species of rockfish, large and unexpected catch events can occur even if vessels are actively intending to avoid those species. Establishing bycatch limits (as opposed to individual quota) can spread the risk of those large and unexpected catch events across a large number of harvesters, thus minimizing the risks individuals face and increasing the probability that a vessel with an unexpected catch event can continue operating. However, common bycatch limits (and the successful management thereof) require that harvesters covered within those bycatch limits be able to collectively agree to management conditions. As bycatch limits are spread across more participants, the possibility that those participants can agree decreases. In the worst case scenario, harvesters will not be able to agree to bycatch management terms, and under these conditions a de-facto race for fish may develop if harvesters do not believe they can stay within the bycatch limit. This can occur because attainment of a bycatch limit means closure of the fishery, sector, or cooperative (depending on the level of management). If harvesters fear their target species opportunities will be preempted by attainment of a bycatch limit, they are liable to begin engaging in Olympic-style behavior, potentially eroding the gains typically attributed to rationalization. Such behavior may mean faster paced harvest activity than expected, more capital being used in the fishery than expected, and lower quality products among other things.

While bycatch limit management at a smaller, cooperative scale may mean that harvesters are more likely to agree to bycatch management terms, management of bycatch limits at the cooperative level increases the risk faced by each individual in that cooperative and makes it less likely that a large and unexpected catch event can be absorbed by the collective harvesters in the cooperative. This situation may mean preemption over bycatch of a different sort than described above, though such preemption is more likely to be contained to the entities engaged in the cooperative than across all the entities in the fishery. In other words, a relatively small level of bycatch management at the cooperative level may create a case where those entities can agree to bycatch management conditions. However, if one member of that arrangement has a relatively large and unexpected tow of a bycatch limit species, it makes it less likely that there will be enough bycatch quota to go around that cooperative to cover that large tow. If this is the

[2] It is assumed that in the case of bycatch being managed at the cooperative level, the "golden rule" would apply for bycatch. This means that catcher vessels in a cooperative would bring bycatch catch history to the cooperative, and the pool of bycatch available to that cooperative would be based on the total bycatch catch history of vessels in that cooperative. Vessels in a cooperative may agree to lease bycatch to one another through private agreement, but in the absence of that private agreement, each vessel would have access to their own bycatch catch history.

case, the entities in that cooperative may have their fishing opportunities closed down, however this event is more likely to be limited to those participants in that cooperative rather than spreading through the fishery as a whole in the form of a race for bycatch.

One factor that may mitigate the risk to individual harvesters if bycatch is managed at the cooperative level is the presence of an intercooperative agreement to manage bycatch. An intercooperative agreement can allow individual cooperatives to develop relationships between one another for successfully managing bycatch species and sharing the amount of bycatch between them, thus spreading the risk across a wider array of participants. Since intercooperative agreements rely on each cooperative agreeing to enter into that relationship, the development of such relationships is likely to rely heavily on each individual cooperative having a successful management plan for their own cooperative members. This provides greater certainty to the other cooperative that management is likely to be successful and therefore, mutually beneficial.

Another possible tool for providing flexibility, on a cross sector basis, is to allow a roll-over of bycatch from one sector to another. If a sector has taken its full allocation of whiting, rolling over bycatch to another sector, or sectors, would provide greater certainty to those other sectors that they would not have fishing opportunity truncated by the attainment of a bycatch limit. Another possible outcome of a roll-over provision for bycatch is that it may provide an opportunity for a sector to be re-opened if they have been shut down because of attainment of a bycatch limit. For example, if one sector is shut down in July because they have hit the bycatch limit of canary rockfish, they may be able to re-open if another sector reaches their allocation of whiting and has some canary rockfish left over. Rolling over that remainder to the sector that had been shut down prematurely may provide an opportunity for that first sector to re-open.

The following table illustrates the type and level of risk associated with each level of bycatch management starting with the lowest level (IFQs) and ending at the highest level (fishery wide bycatch limits). This table is also found in Chapter 4 of the EIS. This table illustrates two forms of risk faced by harvesters when dealing with bycatch species, particularly for overfished rockfish where relatively large and unexpected tows can occur. This table shows that if bycatch is managed at a small level, the implication of an unexpected catch event spilling over and affecting other harvesters is relatively small compared to a case where bycatch is managed at a relatively large level. Inversely, if bycatch is managed at a low level, the burden faced by individuals from an unexpected catch event is large relative to a case where bycatch is managed at a larger level.

Level of Bycatch Management	Collective Risk (risk of a race for bycatch)	Individual Risk (risk posed to individuals from catch uncertainty, and individual accountability)
IFQ	Low	High
Co-op level	Med-Low	Med-High[3]
Sector Level	Med-High	Med-Low
Fishery Level	High	Low

One factor that also contributes to risk is the presence of a non-cooperative fishery. Since the non-cooperative fishery has the potential to be a derby fishery (out of design), the behavior exhibited by participants in this fishery may lead to a greater potential for large catch events of bycatch species. This event has the potential to affect other participants, especially if non-coop fishery participants and coop fishery participants share a common bycatch limit. The risk to cooperative fishery participants posed by the presence of a non-coop fishery is less if the non-coop fishery is managed with it's own bycatch limit rather than having that fishery managed with a bycatch limit that is shared with participants in a cooperative. However, since this non-cooperative fishery is a derby fishery, there is a potential for that non-cooperative fishery to have a "disaster tow" which exceeds the allocation of bycatch species to the non-cooperative fishery (if that non-cooperative fishery has its own bycatch limit). If this event occurs, the non-cooperative fishery can negatively impact other fishery participants. However, the probability of this event occurring can be minimized by the presence of buffers or putting in place area management on non-cooperative fishery participants. These tools are discussed in the next section.

Seasonal Releases, Area Management, and Bycatch Buffers

<u>Seasonal releases</u> of bycatch can, in many instances, be viewed as a bycatch management tool used in lieu of sector specific allocations of bycatch, or vice versa. While seasonal releases and sector specific allocations could be implemented simultaneously, there is likely to be redundancy between the two tools. This is because each sector operates at a somewhat different time period meaning seasonal releases are likely to have a sector by sector allocation effect, resulting in something similar to sector specific allocations.

Seasonal releases are one method of protecting one sector from another (since the sectors operate at different times) and minimizing the risk of bycatch occurring in one sector affecting the opportunities in another sector. If the amount of bycatch allocated to each season is structured in an appropriate fashion, such seasonal releases may allow successful prosecution of whiting activity while insuring that the sector that starts later in the year is not pre-empted by the attainment of a bycatch limit from sectors operating earlier in the year.

One restriction created by a seasonal release of bycatch is that it may make it difficult for harvesters in a sector to change the timing of their fishing opportunity. If, for example, 50 percent of the widow is allocated to the time period between May and June, that 50 percent allocation of widow may work effectively at preserving fishing opportunity based on past practice. If one sector desires to spend more time fishing in the fall months, or alternatively another sector wishes to fish earlier, that amount of widow allocated to the May through June time period may be inappropriate and may make it difficult for harvesters to change the timing of their operations (because there would presumably be different seasonal widow rockfish needs). Compare this situation to a case where each sector or cooperative has their own bycatch limit where harvesters can choose the harvest timing they find most appropriate and use the allocated bycatch during that time. Under this latter situation, changing harvest timing may be relatively simpler compared to a case where seasonal releases of bycatch are made. Under the sector allocation scheme, each sector may determine when to use their bycatch and can adjust seasonal fishing patterns accordingly.

One benefit of the seasonal release strategy is that if that seasonal release is applied to a fishery-wide bycatch limit situation (instead of sector-specific allocations), the seasonal release strategy will continue to minimize the risks faced by individuals (as would be the case under a fishery level bycatch allocation) while still preserving fishing opportunity throughout various times of the year. For example, if a fishery wide bycatch limit is used and harvesters cannot agree to a bycatch management plan, then a seasonal release strategy would continue to protect the shoreside whiting sector from the at-sea sectors (which start earlier). In addition, harvesters that encounter large and unexpected catch events would face a relatively low burden for doing so because the covering of that catch event would be spread out across the multiple participants in the fishery instead of being concentrated on that one harvester or that one harvester's cooperative.

In summary, the seasonal release strategy is a tool that can be used to protect preemption of one sector by another if bycatch limits are stretched across multiple non-tribal whiting sectors. Retaining a fishery-wide bycatch limit will also spread the risks of bycatch limit management across a wide number of participants. However, seasonal releases may make it difficult for sectors to adjust the timing of their fishing operations assuming bycatch is different at different times of the year. Sector specific bycatch limits can also prevent preemption of one sector by another. Sector specific limits will reduce the amount of risk sharing because bycatch limits are broken into smaller units with each unit spread across a fewer number of participants. Sector specific limits can, however, make it easier for sectors to change the timing of their fishing operations because they can choose when to use their bycatch. Implementing both sector specific limits and seasonal releases simultaneously is likely to create redundancy. Because sectors prosecute fishing opportunities at different times of the year, the seasonal release will likely have an allocative effect, like sector specific bycatch limits.

<u>Area Management</u> is a tool that can be described as one used to mitigate the risk of unexpected tows of bycatch species. It may be reasonable to expect that a successful bycatch management plan from a cooperative would include provisions for area management. Therefore, establishing area management through regulation and implementation by the agency may be more appropriately used to mitigate risks if bycatch limits are set at the fishery level and not the co-op level. However, establishing area management in regulation can also be used to mitigate the risk posed by the presence of a non-coop fishery. Area management can be used to hedge against the possibility that a harvester in the non-cooperative portion of the fishery will unexpectedly encounter a large amount of a bycatch species. This may be done by imposing area management on participants in the non-cooperative fishery while not imposing that same area management on participants associated with a cooperative.

Area management may be necessary if bycatch is managed at the fishery level because individual cooperatives would not be internalizing management of their own bycatch and would still be sharing some of the burden with other cooperatives. If cooperatives are internalizing the management of their own bycatch, bycatch management provisions in the cooperative agreements are likely to be relatively more robust. As cooperatives become less responsible for their own bycatch, it is not unreasonable to expect that the cooperative agreements, and the bycatch management plans contained therein, would be less robust, meaning area management may be increasingly important if bycatch is managed at the fishery level, but less important if bycatch is managed at the co-op level. Area management imposed on the non-cooperative fishery may be entirely appropriate in either case to minimize the risk associated with the presence of a non-cooperative portion of the fishery. In this case, area management restrictions could be placed on harvesters in the non-cooperative fishery.

<u>Buffers</u> are another tool that can be used to protect coop fishery participants from unexpectedly large bycatch events in the non-coop fishery. If buffers do not exist and a non-cooperative fishery exceeds the amount of bycatch allocated to it, then that overage would need to come out of other fishery participants. If bycatch is managed at the coop and non-coop level with an aggregate limit on the sector, then an overage in a non-coop fishery can restrict opportunities for coops in that same sector. If the non-coop fishery has a buffer, then that buffer essentially hedges against the possibility of a bycatch overage restricting the fishing opportunities for coop fishery participants.

The appropriate buffer size is likely to be on a species by species basis. Empirical evidence from the fishery under status quo conditions provides one example of catch uncertainty and the magnitude of buffers that may be necessary for a non-coop fishery. This is a non-coop fishery may act similarly to the existing fishery. Based on evidence from past recent years, canary rockfish and darkblotched rockfish appear to be subject to less variability or less potential for “disaster tows”. However, in one of the last four years, a large tow of canary rockfish occurred which jeopardized the continued operations of all three whiting sectors. In this event, there is not likely to be a buffer large enough to matter. However, ignoring that particular event, other data suggests that canary rockfish encounters are less variable and therefore less likely to need a large buffer. Darkblotched rockfish appears to exhibit a similar pattern with less variable catch events. Widow rockfish is different from these two species because there is substantial variability in catch events. Some tows encounter relatively little, while others may encounter several dozen metric tons. In the case of widow rockfish, a large buffer on the non-coop fishery may be necessary to minimize the risk to the coop fisheries posed by the presence of a non-coop fishery. In any event, there does not appear to be a “one size fits all” buffer and therefore if buffers are used, a range of available buffer sizes to be used on a case by case basis may be the best approach.

B-1.4 At-sea Observers/ Monitoring

The type of at-sea observing/ monitoring system is an important component of cooperative function. By their very structure, cooperatives rely on robust monitoring of catch onboard harvesting vessels. This monitoring/observing must be accurate enough that cooperative members can self-enforce one another and have confidence in the catch estimates that are associated with individual vessels. One additional element that is a necessary piece of an at-sea observing/monitoring program in a cooperative-based fishery is for harvesters to have access to the catch estimates generated by at-sea observers/monitors. This is because cooperatives are structured in a manner that relies on cooperative members self enforcing and transferring catch privileges among one another without agency involvement. In order for self enforcement and catch privilege transfers to occur, it is necessary that a third-party (one that is not the crew or captain on a vessel) monitor the catch that occurs. This is because having catch monitored by that third party places each harvesting platform on an equal footing when considering catch and eliminates or reduces the ability for individual harvesters to cheat on their catch records. If catch monitoring of vessels in a cooperative was left up to the skipper or crew of a vessel, there would be substantial incentives for “cheating” and the agreements and collective management typically associated with a cooperative may erode or be eliminated because of the lack of trust in catch estimates.

Further analysis of observing/monitoring systems is being undertaken by NOAA Fisheries.

B-1.6 Adaptive Management

An adaptive management provision can be used to achieve multiple objectives. The outcome of the provision depends on the objective and the manner in which the provision is used to achieve the objective(s). In order to facilitate analysis, we assume that the adaptive management provision is used for several different outcomes in the whiting fishery including: salmon bycatch reduction; overfished species bycatch reduction; community protection; and to facilitate new entry into the fishery, where new entry is defined as the establishment of new vessel owner-operators.

The use of adaptive management to facilitate salmon bycatch reduction may work as a benefit to those harvesters that have a demonstrated ability to reduce bycatch, or to harvesters that plan to experiment with new gear designs to test the efficacy of new gears for reducing salmon bycatch. If the latter approach is used for the adaptive management program, the testing of new gears may eventually be followed up by a regulatory amendment requiring whiting harvesters to use a different gear type that has demonstrated success in reducing salmon bycatch. It should be noted that the Council has given no indication that this is the process that would be followed. However, assuming this is the process that would be followed is useful for illustrating the possible effects of this provision.

If a process is followed where the adaptive management provision is used to encourage the development of new gears, then it is likely that any benefit to harvesters from experimenting with new gears would be short term. As the success of experimental gears is determined, it is very likely that the need for directing adaptive management to those harvesters would not be necessary because the next logical action may be a regulation designed to implement one of those gears, or the determination that the gear is not successful. Upon the determination that a regulation will be put in place, or upon a determination that the gear is not successful at reducing salmon bycatch, it would presumably not be necessary to direct the adaptive management quota toward those harvesters, thus freeing up adaptive management quota for another use and ending the benefit that recipients of that quota have received. However, the original recipients of that adaptive management quota would have future opportunities for receiving adaptive management quota by attempting to achieve other, future objectives that may be specified by the Council.

If adaptive management quota is used to reward those with a demonstrated ability to reduce salmon bycatch, then the quota may be more long term depending on the long term performance of harvesters in reducing salmon bycatch. If those harvesters demonstrate a continued ability to reduce salmon bycatch more than others, then they may continue to be recipients of that adaptive management quota. However, this usage also depends on the way the objectives are specified. For example, if the adaptive management quota is distributed to the top 5 harvesters (in terms of salmon bycatch reduction) then there are opportunities for harvesters to receive the adaptive management quota over the long term. However, if the objectives set a bench mark for reducing salmon bycatch to a specified rate, then more and more harvesters may begin meeting that benchmark, thus reducing the amount of adaptive management quota available to each harvester meeting the bench mark.

Using adaptive management for overfished species bycatch reduction may work in the same manner as using that adaptive management quota for salmon bycatch reduction. Again, the specific effects of using adaptive management for overfished species bycatch reduction depend on the objectives and the specific manner in which the objectives are achieved. The effects may be short term or long term. If the objectives are achieved in a way that allows harvesters to benefit over the long term from adaptive management, those harvesters that alter fishing practices in order to achieve overfished species bycatch reduction may, in turn, receive adaptive management quota over the long term. However, if adaptive management quota is used to encourage the development of new gears, which are then put into regulation if successful, then recipients of adaptive management quota are likely to receive that quota only for as long as it takes to determine whether a new gear design is successful.

The use of adaptive management quota for community protection will almost certainly have relatively positive effects to those communities that are recipients of that quota, however using the adaptive management quota in this way may have differing effects across participants in the fishery and on processors and businesses that rely on fishery activity. It is unclear how an adaptive management provision used in the at-sea sectors of the fishery would be used to achieve community protection objectives. Since the at-sea fishery does not make routine deliveries to shoreside processors and does not make routine stops into port, except perhaps cities in the Puget Sound region, it is not clear how using the adaptive management provision in the at-sea fishery for community protection could be achieved. In the shoreside whiting fishery, activity is more closely aligned with a geographic place. Using adaptive management quota in the shoreside whiting fishery could be used to direct landings of whiting to certain ports, thus spurring fishing related activity in a distinct area. It is unclear at this time how the specific mechanisms would work in order to achieve this outcome.

Adaptive management could be used to facilitate new entry (in the form of new owner operators). This could be accomplished by allocating the adaptive management shares to entities that indicate a desire to enter into the fishery. However, there is some question about how this would work since catch history assignments made to CV(MS) permits are not divisible and not separable form the permit. Thus, a new entrant to the fishery would still need to acquire a CV(MS) permit with catch history to remain in the fishery. Adaptive management quota may make it easier for a new entrant to acquire the CV(MS) permit since that new entrant would have access to the catch associated with the CV(MS) permit as well as to the catch attributed to him/her from the adaptive management provision. This would tend to increase revenues (both gross and net) to the new entrant, increasing the ability for that new entrant to purchase the new permit.

Although the adaptive management provision could be constructed in a manner that facilitates new owner-operators, cooperatives rely on close knit and long term relationships for success. This means that some barriers to new entry are necessary in order to maintain stable relationships between harvesters in a cooperative. As discussed in Chapter 4, collective institutions – like cooperatives – often develop complex relationships and/or function in complex systems effectively. The ability to work within these complex systems requires that participants be stable and that entry and exit be limited in order for relationships to develop and for knowledge to be shared across participants.

B-2 WHITING MOTHERSHIP SECTOR CO-OP PROGRAM

Overview: Qualified permits will be endorsed for MS co-op participation. Each year the holders of those permits will choose whether their vessels will fish in the co-op fishery, in which individual co-ops will direct harvest, or fish in a non-co-op fishery that will be managed by NMFS as an Olympic style fishery. The co-op will be obligated to deliver its fish to specific mothership processors based on the obligations of each permit in the co-op. Limited entry permits will be issued for motherships and required for a mothership to receive whiting from catcher-vessels.

Catcher-vessels participating in the mothership sector must be a limited entry trawl vessel. Only those vessels that have a CV(MS) endorsement are able to fish in either the coop or in the non-coop portion of the fishery. Vessels with a limited entry groundfish trawl permit may participate in a coop and harvest the catch available to that coop, but those vessels that do not have a CV(MS) endorsement cannot participate in the non-coop fishery. These participation requirements effectively limit participation in the sector, but mechanisms exist that allow capital in the fishery to change and adapt to varying conditions. Allowing any limited entry trawl vessel to participate in a coop for example allows the cooperatives the flexibility to determine the amount and type of capital appropriate for harvesting the fish available to the cooperative. This also provides a greater certainty that the harvest available to the cooperative will be realized. If a situation occurs where CV(MS) endorsed vessels in a cooperative all travel to the Bering Sea to participate in the pollock fishery and cannot leave the Bering Sea without foregoing pollock catch, that MS whiting cooperative can find other licensed trawl vessels on the west coast to harvest their allowable catch, thus providing a mechanism for harvesting the cooperative catch while not foregoing other harvest opportunities. For those motherships that may be relying on harvest from MS whiting cooperatives, allowing licensed trawl vessels without a CV(MS) permit to harvest cooperative fish provides a greater certainty that the catch in that cooperative will be realized and the motherships will be able to expect delivery activity from the catch attributed to those cooperatives.

Mothership Limited Entry
Establishing a mothership limited entry program stabilizes participation of motherships in the mothership sector. This stability may lead to longer term relationships between catcher-vessels and motherships compared to a case where there is no limited entry for motherships. In addition, in a cooperative structure, the processor or mothership may end up acting as the centerpiece of the co-op organization and in this way help to coordinate and facilitate the harvest activities of vessels in a coop. Having an open class of processors would arguably tend to disrupt the organizational structure and coordination of harvest

activities if catcher-vessels are not consistently delivering catch to a single entity. This is because motherships may begin to compete for catcher-vessels throughout a season and this could erode the stability in the CV-mothership relationship that's necessary for a coop to function effectively if the mothership is the organizational centerpiece. Another argument for closing the class of processors is because it fosters economic stability. A system with a closed class of processors and a linkage between catcher-vessels and processors arguably creates an organizational structure that begins to resemble a vertically integrated firm between processors and catcher-vessels. In this type of structure, profit sharing arrangements are more likely to result and the interests of the processor and catcher-vessels become more aligned. Profit sharing arrangements and a set of common goals would tend to lower the risk of strikes which can polarize industry members and cause economic harm to all sides of industry involved.

If mothership participation is not limited, new motherships may enter into the fishery. If catcher-vessels are allowed to freely deliver to any mothership, this would lead to increased competition between motherships for catch from catcher-vessels. This is likely to play into the catcher-vessels favor because it is likely that catcher-vessels would receive higher prices as a result. However, if switching motherships requires that a catcher-vessel fish in the non-cooperative fishery, having new motherships enter into the fishery may make it more likely that catcher-vessels will move into the non-cooperative portion of the fishery in greater numbers, or on a more frequent basis. Increased participation in the non-cooperative portion of the fishery may increase the probability that bycatch management problems will arise since this non-cooperative portion of the fishery is a competitive, derby fishery and participants are therefore less likely to fish "cleanly".

If new motherships were allowed to enter into the fishery, the effect on existing motherships would tend to be adverse. New motherships would likely reduce the number of catcher-vessels (and therefore catch) delivering to the average mothership, which would lead to reduced revenue being generated by each mothership operation. Limiting the number of motherships would work in the opposite direction with more catcher-vessels delivering to the average mothership. However, inter-related factors exist in the components of the mothership sector cooperative alternative which potentially make the outcome of a establishing a MS permit less certain. In particular, the issue of catcher-vessel ties and the amount of catch history that is linked to a mothership can affect mothership and catcher vessel profitability. The degree of tie may also have an effect on the stability of the relationship between the catcher vessel and mothership and the likelihood of a catcher vessel participating in the non-cooperative fishery to break that linkage.

Degree of Mothership Linkages and Catcher Processors Operating as a Mothership in the Same Year
If less than 100 percent of catcher-vessel catch history is linked to a mothership, then catcher-vessels can deliver a portion of their catch to a mothership of their choosing. If a mothership and catcher vessel are at odds, it may be more likely that the catcher vessel would continue the linkage without participating in the non-cooperative fishery to break that linkage. This is because that catcher vessel could deliver the unlinked portion of the catch history to another mothership, possibly making the relationship with the linked mothership more palatable. Decreasing the probability that a catcher vessel will participate in the non-cooperative fishery may improve the chances that bycatch will be managed successfully.

Some rationale has indicated that if catcher-processors can participate in the mothership sector and the catcher-processor sector simultaneously, then the unlinked catch history in the fleet may be delivered to that catcher processor, and over the long term that catcher processor would acquire an increasing proportion of the mothership sector's catch as vessels switch processors. The argument for this occurring is that participation in both the C-P and mothership sectors would allow that vessel to capitalize on opportunities to a greater degree, and that vessel may be able to use that to their advantage by paying higher prices for fish from catcher vessels. However, contrary rationale exists that indicates a C-P participating in both sectors may not have an advantage and may not have the ability to increase its share of mothership sector catch. If a catcher processor operates as a mothership, the revenue generated from mothership activity may be the same as the revenue generated by other motherships. Furthermore, it would require that an existing mothership be removed (assuming limited entry exists for motherships). Removal of one mothership and replacement by a vessel also engaged in the catcher-processor sector would effectively reduce mothership processing capacity since that C-P vessel would be handling fish from both sectors. Since C-P fish is being processed in the factory, it reduces the ability to handle fish from other sectors. Because of this diminished capacity, that company may not have an increased ability to acquire more deliveries from harvesters. To the contrary, that company may have its' ability to acquire more deliveries actually reduced. In any case, the effect of allowing a catcher processor to operate as a mothership in the same year is not immediately clear.

B-2.2 Permits/Endorsement Qualification and Characteristics

B-2.2.1 Catcher-vessel Mothership Whiting Endorsement (CV(MS) Whiting Endorsement)

Qualification for a catcher-vessel mothership endorsement is subject to two possible formulas. One formula grants an endorsement based on participation from 1997-2003, while another formula grants an endorsement based on participation from 1994-2003. Both formulas exclude permits that have not harvested more than 500 metric tons. This 500 metric ton filter excludes two permits that participated in the fishery. One participated in 1994, while the other participated in 1995. Of those permits that harvested more than 500 metric tons, only one permit is affected by the choice of allocation formulas. The inclusion of this permit and associated catch history into the initial allocation does not appear to affect the other permits to any discernable degree because the amount of quota allocated to this permit is small.

	AD-HOC PERMIT ID	Qualification Years Considered for Receiving a Mothership CV Endorsement									
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Permits Included/ Excluded by Formula	A		X								
	B		X		X						
	C			X	X	X					
	D			X			X	X			
	E	X		X	X						
	F	X	X		X	X					
	G	X			X	X					
	H	X	X	X	X		X		X		
	I	X			X	X	X				
	J			X	X	X	X	X			
	K					X	X	X	X		
	L					X	X	X	X	X	X
	M	X	X	X	X	X	X	X			
	N	X	X	X	X	X	X	X			
	O	X		X	X	X	X	X	X		
Permits Not Affected by Formula	P	X	X	X	X	X	X	X			X
	Q	X	X		X	X	X	X	X		
	R	X		X	X	X	X	X	X	X	
	S	X	X	X	X	X	X	X	X		
	T					X	X	X	X	X	X
	U	X	X	X	X	X	X	X	X		X
	V	X	X	X				X	X	X	X
	W	X	X	X	X	X	X	X	X		
	X	X	X	X	X	X	X	X	X	X	X
	Y	X		X	X	X	X	X	X	X	X
	Z	X	X	X	X	X	X	X	X	X	X
	AA	X	X	X	X	X	X	X	X	X	X
	BB	X	X	X	X	X	X	X	X	X	X
	CC	X	X	X	X	X	X	X	X	X	X
	DD		X	X	X	X	X	X	X	X	X

B-2.2.2 Mothership Processor Permit

B-2.3 Co-op Formation and Operation Rules.

Two options exist for coop formation. One option requires that coops form around the mothership processor to which they deliver to, while the second option allows a single cooperative to form among all catcher vessels in the sector, but participants in that single cooperative may deliver to several different motherships.

One intention of establishing the multiple coop requirement was the idea that if multiple coops were required, they would be more likely to be made up of like-minded individuals. Other rationale was that operational timing between the mothership and associated catcher vessels would be improved if multiple coops were required. However, it is not immediately clear that either would actually be the case. To the contrary, requiring that multiple coops be formed may restrict the ability for like-minded individuals to coop with one another. Requiring that catcher vessels form coops with others that deliver to the same mothership does not necessarily mean that participants in that cooperative will be of a like mind. Harvesters may have more in common with other harvesters that deliver to another mothership, but those harvesters may have formed a relationship with different motherships for business reasons. Since cooperatives act to coordinate the harvest of member vessels, it may be more important that catcher vessels be able to form coops based on similarities in harvesting practices rather than similarities in to whom they deliver. Though it is likely that participants with similar harvest patterns will also have similar delivery patterns, similarities in harvesting practices may be different from delivery practices. Therefore, requiring multiple cooperatives may actually restrict the ability for harvesters to coop with like-minded individuals.

In addition to the above factors, requiring multiple coops may increase the administration burden associated with coop management. If separate coops are required, coops are likely to rely more on inter-cooperative agreements among one another, and the agency may be tracking and closing more entities than if a single cooperative was allowed to form.

When the Intention to Fish in Coop or Non-Coop Fishery must be Made
Filing the intention to fish in the coop or non-coop portion of the fishery is likely to be a necessary rule for administration and implementation of a cooperative-based fishery. In addition, requiring that harvesters state their intention to fish in the cooperative or non-cooperative portion of the fishery for that entire season means that cooperative membership will be more stable. Stability in membership during a year increases the incentives for harvesters in a cooperative to work with one another to resolve any potential issues. If harvesters could leave cooperatives or enter cooperatives as the season progresses, substantial administrative work-load could result in order to track and modify membership, track appropriate catch histories, and attribute ongoing catch to appropriate cooperatives. In addition, if membership of cooperatives can change throughout the year, there is far less incentive for cooperative members to jointly resolve any unforeseen and problematic issues.

Cooperative Agreement Standards
In general, requiring that cooperative agreements meet certain standards increases the chances that cooperatives will operate in a manner that achieves objectives stated by the Council. For example, requiring that cooperatives have a bycatch management plan which includes monitoring and penalty provisions means that harvesters in that cooperative will be striving to reduce bycatch. This behavior is consistent with objectives specified by the Council and found in the MSA. In addition, requiring that cooperative agreements be validated by NMFS ensures that those standards are being met.

Processor Ties

> Permits will be obligated to deliver
>
> > Option 1: all
> > Option 2: 75%
> > Option 3: 50%
>
> of their catch (the permits' "obligated deliveries") to certain motherships, as specified in the following sections. Catch that is not so obligated may be delivered to any mothership with an MS permit.

Analytical Discussion

Processor ties in a cooperative program may serve several different purposes. One goal of the American Fisheries Act was to construct a rationalization system that benefited both harvesters and processors, and the processor tie provision was one means of achieving that goal. The cooperative structure possible under the mothership alternatives resembles those created for the shoreside sector under the AFA (mothership linkages do not exist in the Pollock fishery). Establishing a processor tie makes the harvester and processor both strong entities in the negotiation over profits and the outcome typically is one where profits are shared between both the harvester and processor. In addition, a processor linkage creates a relationship between a harvesting and processing operation that take on the characteristics of a vertically integrated firm. However, as the degree of the processor tie diminishes it is reasonable to expect the amount of profit sharing to move more toward the harvesters favor because the harvester has more influence over negotiations and can "shop around" for the highest price for the un-tied catch history.

In addition to profit sharing, processor ties influence stability in the relationships between harvesters and processors. It may also affect the willingness of a catcher vessel to remain in a coop if a catcher vessel and a mothership are at odds, and this may influence the manner in which the fishery is prosecuted. This issue is addressed in more detail in a following sub-section.

The effect of processor ties should be considered along with the degree of vertical integration that exists in a sector. Vertical integration arguably reduces the need for processor ties since a processor that owns a catcher vessel effectively buys fish from itself and can direct the harvest activity of that catcher vessel. In the mothership sector, available information indicates that 5 trawl permits are "owned" by mothership processing companies and these 5 permits catch approximately 25 percent of the sector's catch in any year. Anecdotal information indicates that partial ownership of vessels exist, making vertical integration higher.

Effect of Processor Ties on Profit Sharing

If properly constructed, processor or mothership ties are likely to result in profits being shared between harvesters and processors. This was one objective of the AFA, and the cooperative structure formed through that legislation. The mothership and shoreside whiting cooperative alternatives resemble AFA cooperatives. One of the most notable differences between processor ties and an initial allocation of shares to processors is the fact that issuing ties implicitly makes the processor or mothership an interested party in the harvesting operations of a catcher-vessel, and makes the catcher-vessel an interested party in the operations of the processor or mothership. In essence, establishing a processor tie provision results in an outcome that begins to resemble the operation of a vertically integrated firm. This is because both the harvester and processor are bound to one another and cannot operate independently. The processing entity cannot process fish without an action on the part of the harvester, and the harvester cannot sell fish without an action on the part of the processor. This construct leads to two powerful entities involved in negotiation over profits generated by the collective harvest and processing activity, and this mutual negotiation power typically results in profits being shared between both harvesters and processors. However, over the long term, the harvester can fish in the non-coop fishery and break the tie, thus potentially leaving the initial processor or mothership with no guaranteed catch, except for the catch that processor may get from the non-coop fishery or from catch history that may not be tied to particular processors. This ability on the part of the harvester to un-link themselves from a mothership by participating in the non-coop fishery provides some long term flexibility and also provides some negotiation power over motherships simply through the threat of breaking the linkage.

Establishing a partial tie between and harvester and a mothership or processor can alter the relationship that results in profit sharing by playing toward the hands of the harvesters. If shares are allocated to harvesters and processors in an IFQ program, both harvesters and processors can attempt to reach an agreement, but if one is not made, then both the processor and harvester can walk away and fish their quota share independently. In a cooperative system with a processor tie, the processor and harvester cannot walk away from negotiations unless the harvester participates in the non-coop fishery. If that tie is only partial, then the harvester can fish the un-tied portion of the allowable catch and deliver to any processor or mothership. However, both the harvester and the processor are still linked to one another through the tied portion of the catch. Such a situation with a partial mothership tie is likely to shift the balance of power into the harvester's favor, and that balance of power will increase as the percent of linked catch history decreases. The harvester gains power by being able to "shop around" with the un-tied portion of the catch history and to leverage higher prices from mothership processors. Motherships are likely to bid among one another for the un-tied catch history, resulting in higher prices paid to harvesters and eroding profits motherships might otherwise realize if all catch history is linked. Inversely harvesters are likely to realize greater profits and operational flexibility if less catch history is linked to a mothership.

In summary, a cooperative system with processor ties results in two powerful entities negotiating over profits in the fishery. The outcome is likely to be one where profits are shared between harvesting and processing operations. If processor tie provisions are less than 100 percent, harvesters are likely to experience greater negotiation power over mothership processors when negotiating over profits. As the tie provisions decrease from 100 percent, negotiation power on the part of harvesters is likely to increase. In a cooperative system with 100% processor tie provisions, both the harvester and processor are in a strong position in negotiations and the outcome as it relates to profit sharing may be quite different.

Effect of Processor Ties on Stability

Stability in the relationship between the catcher vessel and mothership has an economic effect through increased levels of business planning. Establishing a full processor tie creates a relationship that resembles a vertically integrated firm, and operations between the harvester and processor become more aligned as a result. One outcome of this arrangement in the Pollock fishery has appeared to be a relatively paced degree of harvesting operations because the harvester must time deliveries to correspond to the motherships ability to handle them. However, reducing the degree of processor tie may stabilize cooperative membership and make it less likely that a catcher vessel will fish in the non-coop fishery in order to break the tie with a mothership. If a catcher vessel is at odds with a mothership, but needs to fish in the non-coop fishery in order to break that tie, the catcher vessel may continue to remain in the coop if that catcher vessel can deliver part of his catch to someone else. Since the non-coop fishery is inherently less stable than the coop fishery, increasing the chances that a catcher vessel will remain within a cooperative may result in another form of stability over fishing practices. On the other hand, if all catch history is linked to a mothership, the behavior of a catcher-vessel in a non-coop fishery may differ from the behavior of a catcher-vessel in a non-coop fishery if future processor ties established through the delivery patterns in a non-coop fishery are partial. This is because motherships and catcher vessels are establishing a new relationship with one another while in the non-coop fishery. If the catcher vessel will be fully linked to that new mothership in the subsequent year, that catcher vessel may take into account the needs of the to-be-linked mothership while engaged in the non-coop fishery. Taking into account the needs of the future mothership may translate into more careful fishing practices while engaged in the non-coop fishery if less careful practices will adversely impact that mothership.

Degree of Linkage	Effect on Profits and Stability
Full processor linkage	Profits likely to be shared between harvesters and mothership processors. Stability exists between the harvester and mothership leading to paced harvest timing Increases the probability that a catcher vessel will fish in the non-coop fishery to break a processor linkage if the catcher vessel and mothership are at odds
Partial processor linkage	Profits may be shared, but more heavily weighted toward the harvester than in the case of a full linkage Reduces the probability that a catcher vessel will fish in the non-coop fishery if they are at odds with a mothership because that catcher vessel can deliver some catch to someone else.

B-2.4.1 Formation and Modification of Processor Tie Obligations

In the first year of the program, the CV(MS) permit owner's choice will be between delivering in the non-co-op fishery and making deliveries as part of a co-op. If the permit chooses to participate in a co-op its obligated deliveries must go to the licensed mothership to which the permit made a majority of its whiting deliveries in

> **Option 1:** The most recent year that it fished before the program was implemented
> **Option 2:** The mothership to which the permit delivered the majority of its catch from 1997 through 2004.
> **Option 3:** The mothership to which the permit delivered the majority of its catch from 1994 through 2003.

If a mothership does not qualify for an MS permit in the first year of the program, the vessels which delivered to that mothership in the previous year may deliver its obligated catch to the qualified mothership to which it last delivered its majority of catch. If none of the motherships to which the permit would be obligated qualify for an MS permit, the permit may participate in the co-op and deliver to a licensed mothership of its choosing. Alternatively, the permit may choose to participate in the non-co-op fishery.

Thereafter, each year, CV(MS) permit owners choosing to participate in a co-op will deliver their obligated catch to the same mothership to which they were obligated in the previous year. However, if the CV(MS) permit owners chose to participate in the non-co-op fishery in the previous year, or did not participate in the mothership whiting fishery it is released from its obligation to a particular mothership and may deliver to any mothership with an MS permit.

Analytical Discussion

Each of the above options creates a relationship between a catcher-vessel and a mothership based on patterns that exist prior to the implementation of a rationalization program. Implementing a system that maintains past relationships between harvesters and motherships may ease the transition from status quo management to a rationalized fishery. However each of these options may result in some implications that, although short term, may have somewhat adverse effects while also having somewhat positive effects.

Option 1 has potential benefits in that it maintains the most recent relationships between motherships and catcher-vessels, and therefore the transition from status quo management to a rationalized fishery may be made easier, at least theoretically, by option 1. However, option 1 may inadvertently result in a race for catch history among motherships in the year immediately prior to the implementation of the rationalization program. This could mean that harvesters receive higher prices for their fish in the year immediately prior to the rationalization program, but it also may end up stimulating race for fish conditions in the mothership sector above those which already exist. If this scenario occurs, it would likely only be for a single year prior to the rationalization program. It is important to note that this concept is entirely theoretical.

Options 2 and 3 implement a program that maintains historic relations between motherships and catcher-vessels, however these historic delivery patterns will be several years removed by the time a rationalization program goes into effect. If the rationalization program goes into effect in 2011 for example, option 2 would be 7 years removed, while catch patterns under option 3 would be 8 years removed. These options may not result in the possibility of race for history conditions like under option 1, but the relationships established under options 2 and 3 may not be the same as those that exist immediately prior to the implementation of a rationalization program, potentially making the transition to rationalized fishery conditions somewhat difficult.

> **Mothership Permit Transfer.** If a mothership transfers its MS permit to a different mothership or different owner, the CV(MS) permit obligation remains in place and transfers with the MS permit to the replacement mothership unless the obligation is changed by mutual agreement or participation in the non-co-op fishery.

Analytical Discussion
Maintaining the mothership tie between catcher-vessels and motherships during the transfer of a mothership permit provides additional certainty to the purchaser of the mothership permit and increases the expected returns associated with that permit, thus making the sale price of any mothership permit better known. However, as stated previously, constructing a cooperative-based system with processor ties implicitly makes mothership interests part of the harvesting activity. This implicit interest becomes evident because of the relationships that exist between the owner or operator of the catcher-vessel and the owner or operator of the mothership. When a new owner acquires a mothership permit, that owner's interests will influence the relations between the catcher-vessel and mothership. If interests and objectives are similar to the old owner of the mothership permit, then the transition from the old mothership permit owner to the new mothership permit owner - and the effect that transition has on linked catcher-vessels – may be relatively seamless. However, if the new owner of the mothership permit has substantially different interests and objectives than the old owner of the mothership permit, then the sale of a mothership permit may cause some adverse effects on catcher-vessels linked to that permit and make the transition to the new owner somewhat difficult.

B-2.4.2 Flexibility in Meeting Processor Tie Obligations

a. **Temporary Transfer of the Annual Allocation Within the Co-op or From One Co-op To Another**
When CV(MS) permit owners transfer co-op allocations from one co-op member to another within the co-op or from one co-op to another within an inter-co-op. If the allocation that is transferred is part of the obligated deliveries, such allocations must be delivered to the mothership to which the allocation is obligated, unless released by mutual agreement.

b. **Mutual Agreement Exception.**
By mutual agreement of the CV(MS) permit owner and mothership to which the permit is

obligated, and on a year-to-year basis, a permit may deliver its obligated deliveries to a licensed mothership other than that to which they are obligated. Such an agreement will not change the permit's future year obligation to the mothership (i.e., the permit will still need to participate in the non-co-op fishery for one year in order to move its obligated deliveries from one mothership to another).

Analytical Discussion
If CV(MS) permit owners transfer catch privileges to another participant in the same co-op, or one co-op establishes an inter-cooperative agreement with another cooperative to transfer catch, then the original processor tie obligation still remains. Requiring that the original tie be adhered to retains the certainty over business planning that the motherships have made regarding that expected catch while also allowing harvesters the flexibility to share and transfer catch history in order to maximize harvest potential and net revenues.

By mutual agreement the processor tie can be broken temporarily. If both the CV(MS) permit owner and the mothership agree, then the catcher-vessel may deliver its catch to another mothership. This mutual agreement exception is temporary and allows catcher-vessels to deliver to another mothership if a case arises that where the original mothership does not elect to participate in the fishery. The fact that the mutual agreement exception is temporary means that the future expectation of catch being received by the mothership can still be reasonably expected.

This element of mutual agreement has a large effect on stability in the fishery. In cases where a mothership may not be able to participate in the fishery for example the catch that mothership entity may otherwise expect in the future is still retained when that mothership returns to the fishery. For the catcher vessel involve, this mutual agreement retains stability because it does not force the catcher vessel to participate in the non-cooperative portion of the fishery in order to eventually fish for a different mothership. This flexibility creates stability in the mothership/catcher vessel relationship but it also creates stability for management since catcher vessels are not forced to enter the non-cooperative fishery.

B-2.4.3 Mothership Processor Withdrawal

Analysis forthcoming

B-2.5 NMFS Role

B-2.5.1 Permit and Endorsement Issuance

B-2.5.2 Fishery Registration and Co-op Approval

B-2.5.3 Annual Allocation to Co-ops and the Non-co-op Fishery

B-2.5.4 Fishery Management and Co-op Monitoring

B-3 WHITING SHORESIDE SECTOR CO-OP PROGRAM

The shoreside whiting cooperative program is nearly identical to the mothership coop alternative in many respects. Those elements of the shoreside whiting coopartive alternative that are the same as in the mothership cooperative alternative are therefore not repeated here. Rather, the analysis here focuses on those cases where the effect appears to be noticeably different or the element is different between the mothership coop alternative and the shoreside whiting coop alternative.

B-3.1 Participation in the Shoreside Whiting Sector

As written, catcher vessels endorsed to participate in the shoreside whiting fishery may participate in a co-op or non-coop portion of the fishery. Furthermore, any groundfish limited entry trawl vessel may join the coop and participate, like in the mothership sector coop alternative. Any processor may receive fish from vessels in the non-coop fishery, but for the first two years of the program, vessels in a shoreside cooperative could only deliver to a co-op qualified processor. At the end of the two year period, any shoreside processor could receive deliveries from vessels in a cooperative. This program does not cover whiting caught incidentally in the non-whiting fishery.

Analytical Discussion

The cooperative structure identified in the shoreside whiting cooperative may behave similarly to the mothership cooperative in several aspects of the program. The structure envisioned would effectively limit participation, but would have mechanisms that allow capital in the fishery in vary according to varying conditions. Like in the mothership alternative, allowing any limited entry trawl vessel to join a cooperative builds in flexibility for using capital that is appropriate for varying conditions. Allowing for any limited entry trawl vessel to become part of a cooperative will not change the amount of catch history assigned to a cooperative, but it would allow the harvest of a cooperative to be realized if, for some reason, vessels with the SS permit cannot participate. This provides some assurance to processors that the catch of a particular cooperative will be realized and that the processors can continue to expect deliveries even if the SS vessels with the SS whiting permits are not actively fishing. For example, if SS whiting vessels are actively participating in the Bering Sea Pollock fishery and cannot return to the west coast to participate in the whiting fishery, they can utilize other limited entry trawl vessels to harvest that whiting.

Establishing a set of processors for which SS deliveries from coops can only be made during the first two years of the program can provide for an adjustment period for shoreside processors that have historically participated in the fishery. During this adjustment period, processors may be able to plan for changes likely to occur in the fishery rather than having those changes imposed relatively rapidly.

From the catcher vessels perspective, ending the linkage with processors after two years should play into the harvester's favor when negotiating over exvessel prices or some other profit sharing arrangement. As indicated previously, the concept of a harvester – processor linkage creates two entities that both have strong negotiation power. The result of a linkage is that harvesters and processor are likely to meet somewhere in the middle on profit sharing arrangements with both the harvester and processor capturing some of the profits in the fishery. Ending the linkage provision after two years means that any profit sharing that may have occurred between the harvester and processor in the first two years would become skewed more toward the harvesters favor after the linkage no longer exists. The degree to which those profits move toward the harvester depends on the relative negotiation power of both groups after the linkage is broken, and this information is not known.

B-3.4.1 Initial Formation of Ties

> During the first two years of co-op formation, permit owners that join a co-op shall be required to deliver their whiting catches to the co-op qualified processors that were the basis of their landing history during the period . . . **Years Option 1**, **2001; Years Option 2**, **2000; Years Option 3**, **2000-2003** . .. .on a pro rata basis. Determination of the processor(s) to which a permit owner is obligated will take into account any of the processor's(s') successors in interest.

Analytical Discussion

The formation of processor ties in the shoreside cooperative alternative is one of the principal differences between the mothership and shoreside alternatives. As stated previously, one of the initial goals for the formation of a harvester-processor linkage in the AFA process was the objective that both harvesters and processors benefit from rationalization. This would occur through a harvester-processor linkage because there are two similarly powerful entities involved in the negotiation over profit sharing arrangements (one harvester and one processor). Under the shoreside cooperative alternative, a catcher-vessel may be tied to multiple processors and this may result in an outcome that is substantially different from a case where a catcher vessel is linked to a single processor.

Linking a catcher vessel to multiple processors gives those processors a relative degree of certainty that they can expect a certain quantity of landings in a given year, barring a premature closure of the fishery because of attainment of a bycatch limit. However, because there may be cases where a catcher vessel is linked to more than one processor, the catcher vessel's negotiation power may be substantially increased compared to a case where that catcher vessel is only connected to one processor. While a given quantity of fish must be delivered to each processor, the catcher vessel could make those processors compete with one another over the timing of those deliveries. Furthermore, if a catcher vessel is at odds with one processor, that catcher vessel can still fish for the other processors, increasing the capability for that catcher vessel to "hold out" against the processor which it is at odds with and increase the chances of receiving a higher exvessel price than may be the case if there was a linkage between one catcher vessel and only one processor.

B-3.4.2 Duration and Modification of Processor Ties (Options 1 and 2)

Analysis forthcoming

B-3.6. EXCLUDE PROCESSOR TIES AND PROCESSOR LICENSING (OPTION)

Analysis forthcoming

B-4 CO-OPS FOR CATCHER-PROCESSORS

Catch by the catcher-processor sector will be controlled primarily by closing the fishery when a constraining allocation is reached. As under status quo, vessels may form co-ops to achieve benefits that result from a slower paced more controlled harvest. The main change from status quo is the creation of a limited number of catcher-processor endorsements. A new entrant will have to acquire a permit with a catcher processor endorsement in order to enter the fishery.

Analysis

The cooperative alternative for the catcher-processor sector does not involve the implementation of a cooperative in regulation. Rather, the alternative maintains the existing allocation of Pacific whiting across sectors, thereby establishing an allocation to the catcher-processor sector, and establishes a limited entry program that limits the number of catcher-processors. The actual formation of the cooperative is left up to a voluntary process and it assumed that the existing voluntary cooperative (the Pacific Whiting Conservation Coop) would be maintained. This alternative essentially extends the action taken by the Council under Amendment 15 into the rationalization program by limiting entry in the catcher-processor sector.

Traditional economic thinking of such a limited entry structure may lead to the conclusion that there are substantial incentives for participants to engage in race-for-fish behavior even though there is a limited number of participants. Such incentives and the resulting reaction of fishery participants traditionally lead to capital stuffing, inefficient use of resources, and less net revenue than may otherwise be the case if participants were not engaging in Olympic-style behavior.

Several factors that exist in the catcher-processor sector make the possibility of an Olympic fishery less likely than what may typically be assumed given the conditions proposed in the catcher-processor cooperative alternative. In particular, the concept of learned behavior may be applicable to the catcher-processor sector. Participants in the catcher-processor sector have voluntarily participated in a harvest cooperative arrangement for several years. Participants have routinely stated the benefits of that voluntary arrangement in terms of economic benefits, bycatch reduction, and others. Therefore, participants in this sector understand the value of maintaining the voluntary structure. Participants in the catcher-processor sector also know the costs of engaging in Olympic fishery conditions. Prior to the formation of the voluntary cooperative, the fishery was prosecuted as an Olympic fishery. In addition, participants in the catcher-processor sector also participate in the Bering Sea Pollock fishery where Olympic conditions existed in the past. Participants in the fishery have indicated that Olympic fishery behavior would reduce revenue compared to the status quo conditions because of greater participation (and therefore higher costs), and fishing earlier in the season when whiting are smaller and less valuable. Therefore participants in this sector understand the cost of not maintaining the existing cooperative. The number of participants in the catcher-processor sector is relatively small. This means that each participant has a noticeable effect on the outcome of the fishery and the way in which it is prosecuted. Furthermore, the group size in this fishery is small, and as described in chapter 4, small groups find it relatively easy to form collective agreements.

Because of the reasons described above, it appears that the likelihood of participants in the catcher-processor sector engaging in Olympic fishery-style behavior is relatively small if a limited entry system was put in place. This is because participants in that sector likely see the benefits of maintaining that cooperative structure and the cost of breaking apart the cooperative. However, certain factors may be injected into the fishery that could cause Olympic style conditions. One factor that may make it difficult for the voluntary cooperative to be maintained is if bycatch limits are set at levels that are too small relative to the whiting allocation, or if bycatch is managed commonly across the three non-tribal whiting sectors. Bycatch limits can influence the success of the voluntary cooperative because the concept of a collective agreement relies on participants believing that they can achieve a given outcome. If participants in the cooperative do not believe that they can harvest the available whiting given the size of the bycatch limit, then they may not believe there is a benefit to maintaining the cooperative structure and begin to race for fish.

Managing bycatch across the three whiting sectors may result in a similar outcome, though for a slightly different reason. If participants in the voluntary cooperative believe that an outside force (another sector) has a reasonable probability of preempting their harvest opportunities, then participants in the catcher-processor sector may engage in race for fish behavior. This is because agreements formed among participants in the catcher processor sector may not have a direct control over the way bycatch is managed. If another sector can preempt the catcher processor sector even in light of a bycatch management agreement among catcher processors, then participants in the catcher-processor sector may race for fish because of bycatch.

B-4.3 NMFS Role

B-4.3.1 Permit and Endorsement Issuance

B-4.3.2 Annual Allocation

B-4.3.3 Fishery and Co-op Monitoring

Appendix C Description and Results of Analytical Tools

1. A Comparative Advantage Analysis Illustrating the Potential for Regions to be Made Better or Worse Off by Rationalization of the Non-Whiting Trawl Fishery

Several variables determine the amount of fishing activity occurring in different ports, including access to fishing grounds, port infrastructure, and fish purchasing and processing amongst other things. In a rationalized fishery, the incentives created by market-based management and individual accountability may impose additional forces that will alter the decision that vessel operators make regarding the location of fishing activity, the delivery location, and home-port location for a given vessel. Assuming profit is the motivating factor for fishers engaged in commercial fisheries then the decision framework created by a rationalized fishery will tend to shift the location of fishing and delivery activity.

Under status quo management vessels are not held individually accountable for the amount of fish they catch, provided their landings are within their cumulative landing limit. In addition, operators cannot choose to grant their cumulative limit to another, potentially more profitable, operator. Under a rationalized fishery, both scenarios change and fishers are held individually accountable and can transfer their fishing privilege to another vessel. The aspect of individual accountability will tend to put pressure on operators to fish in areas with lower encounter rates of constraining overfished species and the ability for transferring catch privileges allows the fleet to consolidate to fewer, but more profitable vessels as the market directs quota in a manner that is more economically efficient.

In a rationalization program, more economically efficient vessels are expected to remain in the fishery, while less efficient vessels are expected to drop out of the fishery. Economic efficiency is determined by several variables including the ability of the operator to generate gross revenues and the vessel's cost structure. Cost structure is determined by variable costs such as fuel, by fixed costs, and also by "transfer costs" and the cost of doing day to day operations. Ports that have a higher degree of fishing support business (agglomeration) tend to make it easier and more efficient for operators to conduct day-to-day activities and this makes the cost of running a fishing business, acquiring parts, and negotiating work relationships lower than in other ports.

Given these arguments, it is reasonable to expect ports with vessels that have a relatively long travel time to fishing grounds, have relatively unsuccessful operators, relatively costly vessels, and relatively few support businesses to be at a disadvantage when compared to other regions. In addition, ports that are adjacent to fishing grounds with high constraining overfished species abundance would also tend to be at a disadvantage as the presence of constraining overfished species would encourage operators to move to areas with lower abundance. Given enough disadvantaging (or advantaging) factors in a port, that port may find itself losing (or gaining) trawl groundfish activity after rationalization, absent some mitigation tool that the Council may elect to implement as part of the program.

Information is available to illustrate these relationships and provide information indicating which ports or areas may be at a relative advantage or disadvantage. Available information includes:

- Logbook data can be used to show the preferred fishing grounds of trawl vessels categorized by home port (e.g. we can identify the preferred grounds for Astoria-based trawlers). This information can be combined with West Coast groundfish observer program data to show whether preferred fishing grounds of vessels in some ports are in areas with relatively high bycatch rates of constraining overfished species. Those ports with vessels fishing in areas with relatively lower bycatch rates may be at an advantage in a rationalized fishery.

- West Coast fishing community profiles provide information about community business and infrastructure. In addition, industry members, extension agents, and extension publications are sources of this information. Using the theory of agglomeration, those communities with larger amounts of support business and infrastructure may be at an advantage in a rationalized fishery.

- The fleet consolidation model can be used to identify the geographic effects of consolidation based on the most likely vessels to drop out of the fishery and the most likely vessels to stay in the fishery.

- The initial distribution of quota can be used to show which ports will receive more or less quota relative to status quo and relative to the initial distribution made to other ports. This will determine the initial state of harvest privileges on a regional basis and this initial state may influence the future location of fishing activity.

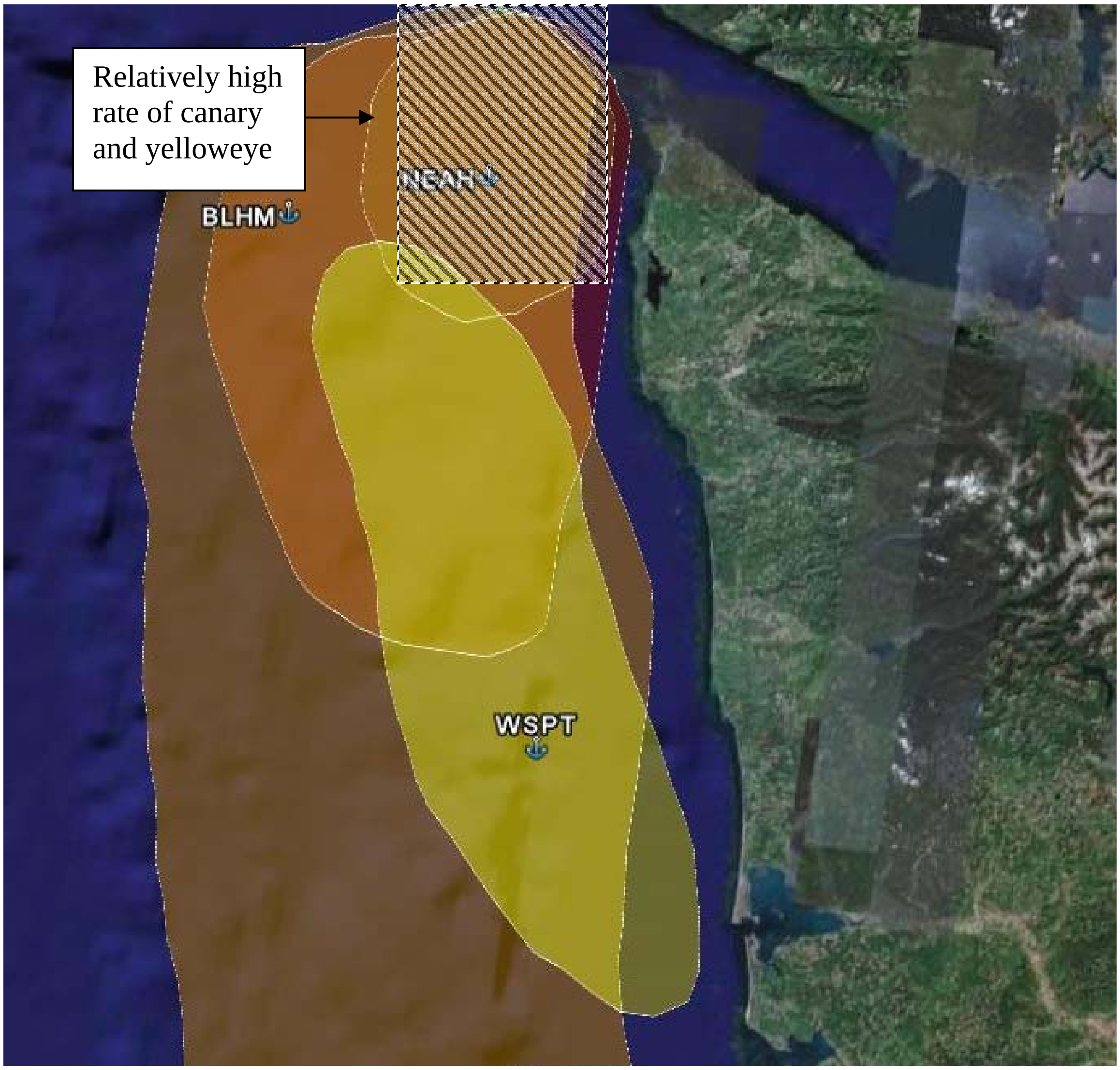
The output of this analysis illustrates the relative advantage or disadvantage each port has with respect to several variables. These variables include 1) bycatch rates of constraining stocks that are in preferred fishing grounds of various ports, 2) relative economic efficiency of vessels in that port, 3) the relative amount of fishing business and infrastructure that exists in that port, and 4) the initial distribution of quota shares to those ports relative to status quo and relative to the distribution made to other ports.

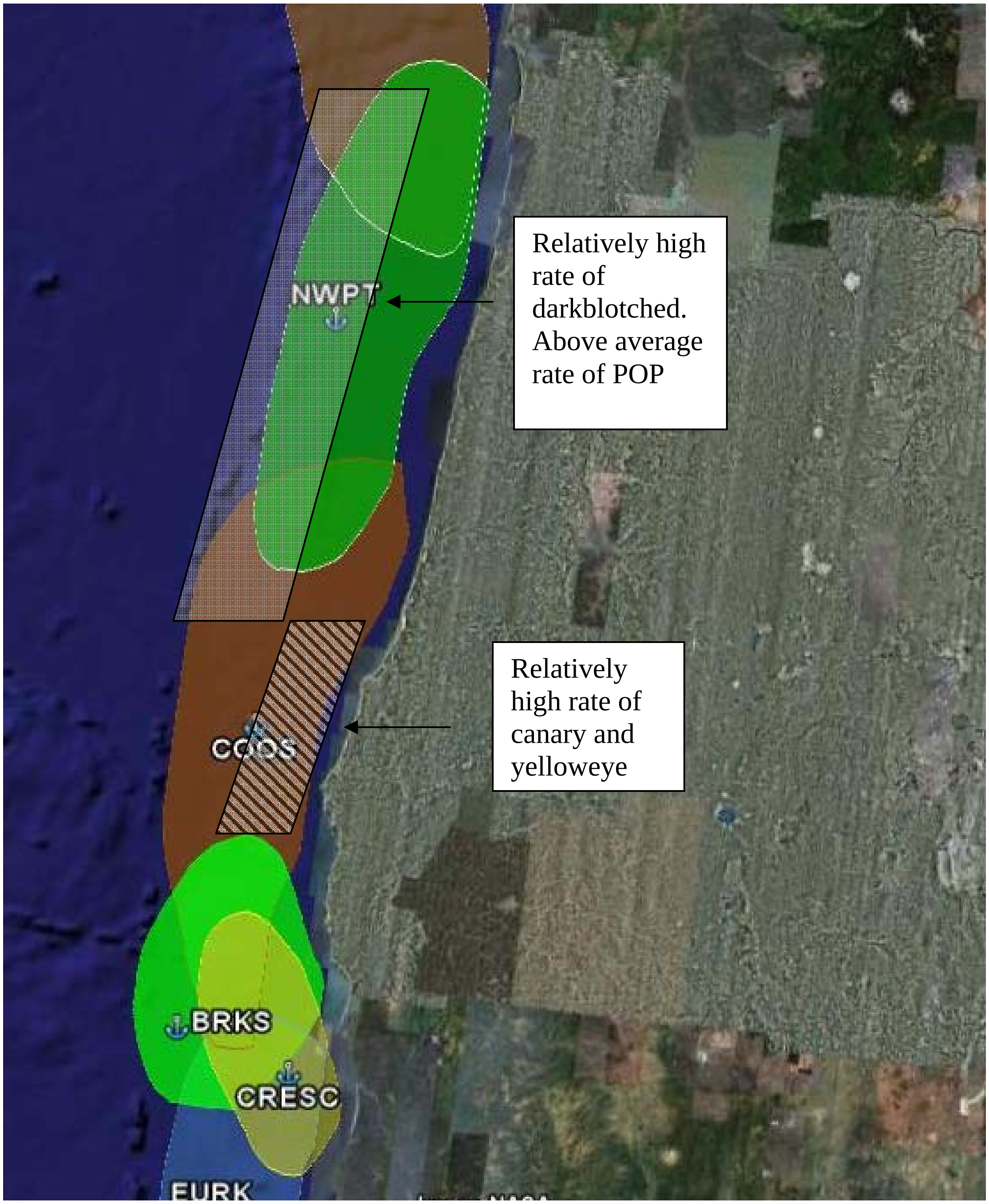
Geographic Assessment of Constraining Bycatch
In this analysis, bycatch rates in various areas are assessed based on the constraining nature of the bycatch species. An area with a relatively high bycatch rate of a highly constraining species is assessed differently than an area with a moderately constraining overfished species. For example, since canary rockfish is a highly constraining species to

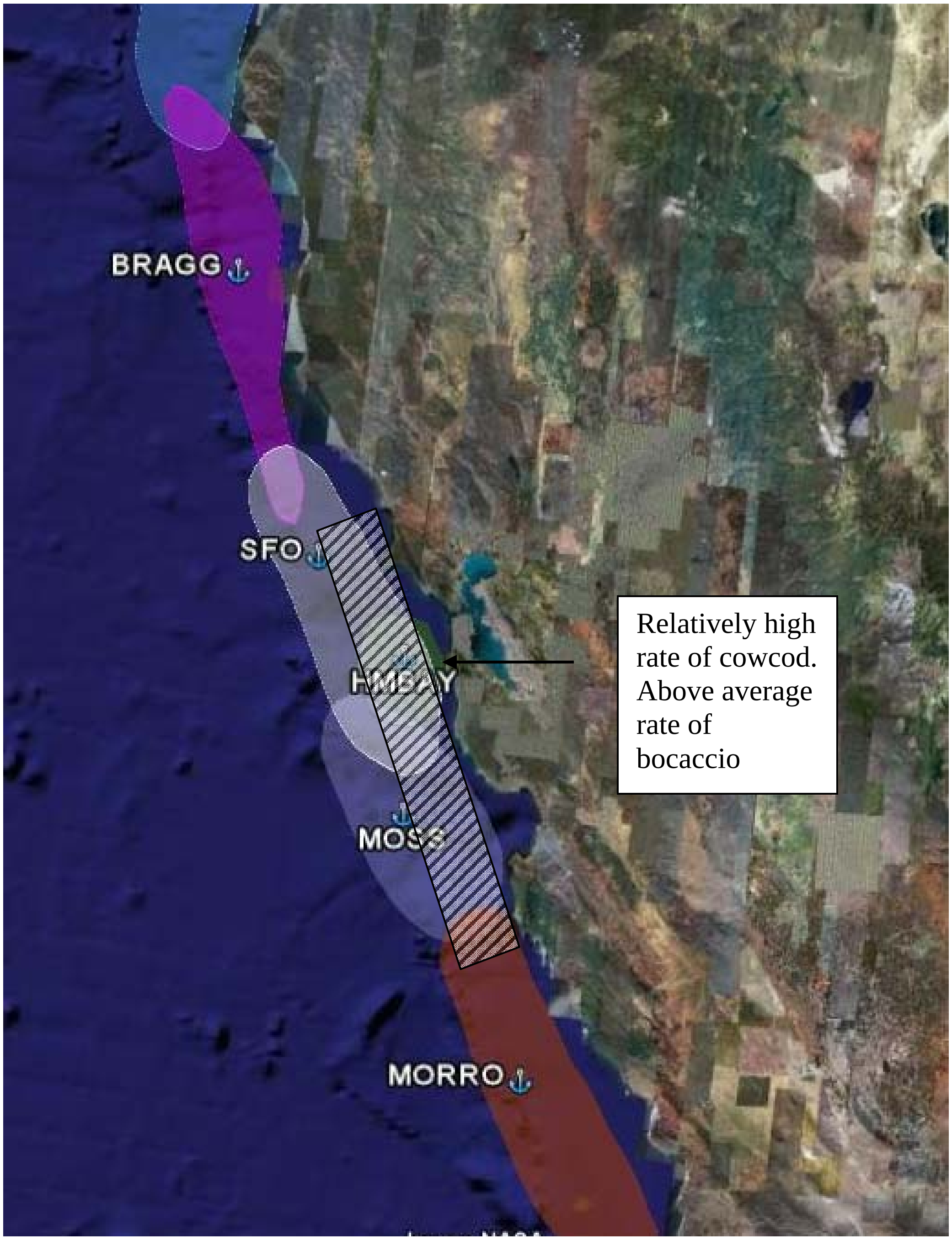
fishing opportunity, an area with a relatively high canary bycatch rate will be labelled as a high bycatch area. An area with a relatively high bycatch rate of a less constraining species, like darkblotched, will be labelled as a moderately high bycatch area. This labelling scheme creates three categories for bycatch areas which are A) not a relatively constraining bycatch area, B) a moderately constraining bycatch area, and C) a highly constraining bycatch area.

The effect of these areas on the comparative advantage of a port relies on the integration of the preferred fishing grounds of various ports with those areas. If vessels from a port fish exclusively in a high bycatch area, then that puts that port at a disadvantage, whereas if vessels from a port spend only some of their time fishing in a high bycatch area, then the presence of that high bycatch area may not necessarily influence the comparative advantage of that port. In this analysis we determine whether a port is at an advantage or disadvantage based on where the majority of the catch has occurred. If greater than 50 percent of a ports' catch has occurred in a high bycatch area, then we determine that port to be at a disadvantage.

The following figures illustrate the preferred fishing grounds of non-whiting trawlers based on their port of landing. These figures also identify areas of relatively high bycatch of constraining overfished species. Areas that are highly constraining are indicated by the presence of a shaded box with hash marks. An area that has the presence of an overfished species that is not typically as constraining is indicated by a shaded box without hash marks. This figure shows one moderately constraining area off Oregon, and three highly constraining areas off the West Coast.


Relatively high rate of canary and yelloweye
NEAH
BLHM
WSPT


Relatively high rate of darkblotched. Above average rate of POP
NWPT
Relatively high rate of canary and yelloweye
COOS
BRKS
CRESC
EURK



By using logbook data we assess the percentage of catch that has occurred within several areas of the coast (defined by seaward or shoreward of the RCA, and by latitude). We then trace each vessels catch to a port of landing based on the port of landing associated with a trawl logbook record. If 50 percent of a ports' landings are associated with a high bycatch area, we assign a double negative score for that port because the majority of it's catch can be considered "at risk" due to the relative difficulty vessels will have in accessing their target species relative to vessels fishing in other areas. For ports that have activity in a moderately high bycatch area, we assign a single negative score. However, it is important to keep in mind that other variables influence the amount of fishing activity that will occur in a port and the presence of a high bycatch area can be overcome by other variables such as an efficient fleet or substantial presence of shoreside infrastructure. The following table illustrates the data constructed as a result of this exercise. Areas shaded in grey are moderately high and high bycatch areas. This information shows that Bellingham, Neah Bay, Newport, and Princeton/Half Moon Bay have greater than 50 percent of their non-whiting trawl catch occurring in areas identified as a moderately high or high bycatch area. It is also important to note that the high bycatch area where the Newport fleet fishes is a moderately high bycatch area because it is made up of species that are less constraining to harvest activity (POP and darkblotched) than the other grey shaded areas.

Table 1 Percent of Non-Whiting Trawl Catch by Port and Area

		LATITUDE AREA							
DEPTH	PORT	N 47.40	45.35 - 47.40	43.55 - 45.35	42.3 - 43.55	40.10 - 42.3	38.25 - 40.10	36.08 - 38.25	34.25 - 36.08
SEA-WARD OF THE RCA	BELLINGHAM/ BLAINE	29.8%							
	NEAH BAY								
	WESTPORT	26.9%	9.9%						
	ASTORIA	16.9%	36.1%						
	NEWPORT			58.4%					
	COOS BAY			28.6%	48.5%				
	BROOKINGS				55.4%	41.8%			
	CRESCENT CITY					57.6%			
	EUREKA					77.1%			
	FORT BRAGG						85.9%		
	MOSS LANDING							72.0%	
	PRINCETON / HALF MOON BAY								
	SAN FRANCISCO						12.2%	74.4%	
	MORRO BAY								97.6%
SHORE-WARD OF THE RCA	BELLINGHAM/BLAINE	69.9%							
	NEAH BAY	95.5%							
	WESTPORT		59.6%						
	ASTORIA	12.0%	34.0%						
	NEWPORT			28.4%					
	COOS BAY				14.6%				
	BROOKINGS								
	CRESCENT CITY					40.7%			
	EUREKA					13.7%			
	FORT BRAGG								
	MOSS LANDING							25.1%	
	PRINCETON / HALF MOON BAY							94.7%	
	SAN FRANCISCO							11.8%	
	MORRO BAY								

Note: totals may not sum to 100 percent because of confidentiality

While the above information shows that several ports are engaged in relatively high constraining bycatch areas, other factors will influence the comparative advantage that vessels have in a rationalized fishery. These other factors include the relative efficiency of vessels that deliver to the various ports, the amount of agglomeration in shoreside business and infrastructure that exists in various ports, and the initial state of harvest privileges in each port as determined by the initial distribution of fishing quota.

Assessment of Industry Agglomeration by Port

The concept of agglomeration is used routinely in regional economic literature. When similar businesses are located in proximity to one another, the cost of doing business tends to decrease. Agglomeration cost savings come from the clustering of economic activity, that is, an attraction for other firms affected by noncollusive proximity economies once a cluster begins to form. {Maki and Lichty, 2000}. Several sources of agglomeration exist including:

- Internal agglomeration. Internal sources of agglomeration typically occur as a firm increases in size and is able to specialize and use standardized inputs.
- Localization economies. These types of economies include situations where a business locates near its suppliers.
- Urbanization economies. These stem from a diverse labor force found in metropolitan areas, the presence of a large number of people, the frequency of communication, and research and development in a populated area that may spur new ideas
- Industry linkages. These linkages create cost savings from such things as transportation. These linkages typically occur in close proximity to one another
- Public facilities and infrastructure. Government facilities and infrastructure comprise a set of units that can compliment clustering of private enterprise.

In this section we describe a series of factors that lead to an assessment of whether a port has a relatively high, or relatively low, level of agglomeration that would benefit a trawl sector. The concept that agglomeration results in cost savings can have implications as a trawl fishery is rationalized and quota flows toward the greatest return.

COMMUNITY	INFRASTRUCTURE
BELLINGHAM/ BLAINE	Bellingham is home to 2 processors of trawl groundfish. Bellingham also has access to a large seafood cold storage facility and has a relatively well developed level of port infrastructure. Bellingham is located on the I-5 corridor, which enhances access to distribution facilities in the Seattle area
NEAH BAY	There are no known processing facilities of trawl groundfish in Neah Bay. Port and harbor facilities are limited and the location is considered remote and removed from distribution and transportation networks.
WESTPORT	Westport has one known processing facility engaged in trawl groundfish. This facility concentrates primarily on Pacific whiting. Westport is somewhat removed from distribution centers
ASTORIA	Astoria has several processing facilities engaged in trawl groundfish. In addition, several support businesses are known to exist in the area and dock and harbor facilities are fairly well developed. Astoria is fairly removed from distribution centers.
NEWPORT	Newport has several processing facilities engaged in trawl groundfish. In addition, several support businesses are known to exist in the area and dock and harbor facilities are fairly well developed. Newport is fairly removed from distribution centers.
COOS BAY	Coos Bay has several processing facilities engaged in trawl groundfish. In addition, support business and fabrication services are known to exist in the area and dock and harbor facilities are fairly well developed. Coos Bay is fairly removed from distribution centers.
BROOKINGS	Brookings has no known processing facilities of trawl groundfish. Brookings is fairly removed from distribution networks, but has a well-developed shallow draft port. Infrastructure necessary to service the trawl sector is limited with one ice house and some small metal-working capabilities.
CRESCENT CITY	Available information shows that Crescent city has one processing facility that has engaged in small quantities of trawl groundfish in recent years. Crescent city is fairly removed from distribution centers. Crescent city has one of the principal vessel fabrication companies used by trawlers on the west coast. Crescent city has a number of fish hoists.
EUREKA	Eureka has one large processing facility engaged in trawl groundfish. An ice house exists in the area as well as a new yard with several hoists. A ship hoist (cradle) exists that can service moderately sized trawl vessels.
FORT BRAGG	Fort Bragg has one known processing facility engaged in trawl groundfish. Fort Bragg is relatively close to the distribution centers in San Francisco. An ice house exists as well as a fuel dock.
MOSS LANDING	Moss Landing is not known to have any processing facilities engaged in trawl groundfish. Transportation networks are close by. Limited infrastructure exists to service trawl vessels.
PRINCETON / HALF MOON BAY	Princeton/Half Moon Bay is known to have three processing facilities engaged in trawl groundfish, but limited processing of trawl groundfish occurs. Several fish hoists exist in the area.
SAN FRANCISCO	San Francisco has several small processing facilities engaged in trawl groundfish. San Francisco has relatively developed port and harbor infrastructure. San Francisco is one of the primary distribution centers on the West Coast.
MORRO BAY	Morro Bay has no known processing facilities engaged in trawl groundfish. Morro Bay is relatively removed from distribution facilities. Infrastructure exists in the harbor area to support commercial fishing operations.

Source:

A) Northwest Fisheries Science Center. 2007. Community Profiles for West Coast and North Pacific Fisheries. Washington, Oregon California, and other U.S. States. NOAA Technical Memorandum NMFS-NWFSC-85

B) Leipzig, Peter. 2008. Personal Communication

Cost Efficiency of Harvesters

The cost efficiency of the local fleet will likely have an impact on how a port fares as a result of rationalization and the consolidation that occurs as a result. Using information from the cost efficiency and fleet consolidation model, we are able to identify the relative efficiency of vessels delivering to various ports. While this information is based on vessels that currently exist in the fishery (and in the longer run we would expect newer vessels to be constructed that are in the efficient range), the initial state can have long term impacts. In other words, ports with relatively efficient trawl vessels at the start of a rationalization program may end up better off than ports with relatively inefficient vessels. The following tables show the number of non-whiting trawl vessels delivering to each groundfish trawl port over the 2004-2007 time period, and the weight of catch being delivered by efficient and inefficient vessels.

Table 2 Number of Non-Whiting Vessels Making Deliveries by Port and Efficiency Category (2004-2007)

PORT	EFFICIENT SIZE	INEFFICIENT SIZE
ASTORIA	13	25
BELLINGHAM*	4	7
BROOKINGS	5	8
CHARLESTON (COOS BAY)	13	14
CRESCENT CITY	2	10
EUREKA	6	21
FORT BRAGG*	0*	12
MONTEREY	1	4
MORRO BAY	5	8
MOSS LANDING	5	16
NEAH BAY	3	4
NEWPORT	11	19
PRINCETON / HALF MOON BAY	1	17
SAN FRANCISCO	5	15
WESTPORT	1	6

* Fort Bragg has four vessels that are very near the efficient size category. It may be reasonable to assume that these vessels will remain in the fishery. Bellingham vessels must travel long distances to reach fishing grounds. While there are several vessels that deliver to Bellingham in the “efficient range”, this travel distance suggests these vessels may be more appropriately categorized as “inefficient”.

Note: not unique records and should not be summed.

Table 3 Weight of Non-Whiting Groundfish Landed by Port and Vessel Efficiency Category (2004-2007)

PORT	EFFICIENT SIZE	INEFFICIENT SIZE
ASTORIA	16,310,277	34,106,827
BELLINGHAM BAY	4,596,540	5,876,909
BROOKINGS	2,382,507	3,998,491
CHARLESTON (COOS BAY)	15,820,364	7,013,554
CRESCENT CITY	C	2,854,037
EUREKA	6,293,634	11,831,280
FORT BRAGG		11,474,450
MONTEREY	C	1,054,166
MORRO BAY	383,468	1,403,130
MOSS LANDING	2,034,403	1,118,074
NEAH BAY	515,476	2,921,366
NEWPORT	4,841,903	11,630,108
PRINCETON / HALF MOON BAY	C	1,901,957
SAN FRANCISCO	591,719	3,963,064
WESTPORT	C	3,032,000

Initial Allocation of Quota Shares

The initial allocation of quota will likely tend to favour some geographic areas more than others, and such geographic differences are likely to extend to the level of fishing activity expected for a given location. Using the initial allocation rules being considered, the following table was developed. This information shows the amount of quota pounds that would be allocated to each port if existing harvest volumes are maintained. This information is broken into two major fields with one field reflecting an initial allocation rule where the buyback history is allocated equally across recipients. The second field reflects an initial allocation made based purely on catch history. The result of this information shows that there are clear patterns that exist regardless of the initial allocation that tend to put a large share of quota into some ports. Using the average across all ports as the indicator of those standing to be made well off, all ports shown in the table from Astoria to Moss Landing stand to be made well off regardless of the initial allocation. Princeton/Half Moon Bay may be made well off depending on the initial allocation rule. It is important to note that the average in this case is the average across all ports, including those that were aggregated into the “other” category in the table below. The “other” category is comprised of 12 ports. These averages result in 600 to 640 metric tons being allocated to ports on average under the equal sharing of buyback options, while 1,400 metric tons is the approximate average for the catch history based options.

Table 4 Quota Pounds Attributed to West Coast Ports (assume status quo harvest amounts)

	Initial Allocation made with Equal Sharing of Buyback History			Initial Allocation made Based Entirely on Catch History		
PORT	75% Hvstr ES	87.5% Hvstr ES	100% Hvstr ES	100% Hvstr HS	87.5% Hvstr HS	75% Hvstr HS
ASTORIA	4,497	4,472	5,068	4,248	4,150	4,115
COOS BAY	2,313	2,365	2,648	2,043	1,944	1,876
NEWPORT	1,891	1,949	1,529	1,046	1,003	999
EUREKA	1,573	1,594	1,425	1,005	1,000	1,008
FORT BRAGG	1,144	1,180	1,357	966	919	873
BELLINGHAM/ BLAINE	1,054	991	1,372	1,192	1,197	1,216
SAN FRANCISCO	754	808	961	744	689	636
BROOKINGS	714	743	724	517	495	477
MOSS LANDING	695	717	769	611	588	567
PRINCETON/HALF MOON BAY	568	612	459	428	409	391
NEAH BAY	472	519	550	483	440	401
MORRO BAY	447	414	412	317	340	364
CRESCENT CITY	363	355	300	226	238	252
WESTPORT	292	304	355	303	288	275
MONTEREY	209	203	200	176	180	185
OTHER	497	502	456	389	383	380

Development of the Assessment Tool

Based on the information described above, we established the following summary of relative comparative advantage. While this information does not allow us to quantify the relative degree of comparative advantage in each port, several patterns seem apparent from this information. In particular, the port of Neah Bay appears as one community that may be at a disadvantage in a rationalized fishery because of fleet efficiency, the lack of shorebased infrastructure, and the high degree of dependence that vessels in this port have on areas defined as “high bycatch”. Inversely, the ports of Astoria and Coos Bay appear to be at a relative advantage compared to other ports. Astoria has the benefit of a relatively large number of efficient vessels, a relatively large presence of shorebased infrastructure, and a low dependence on fishing grounds located in high bycatch areas. Coos Bay also appears to be at a relative advantage because of fleet efficiency and the relatively large amount of shorebased infrastructure. While catch landed in Coos Bay has historically been caught in high bycatch areas, this amount of catch does not constitute the majority. Therefore, it is likely that vessels originating in Coos Bay will adjust fishing practices to avoid bycatch, but the community is not likely to suffer as a result.

Other communities are less certain. Bellingham and Half Moon Bay may see their vessels bearing a relatively high degree of constraint because of their reliance on fishing grounds in high bycatch areas. The efficiency of vessels in Half Moon Bay is relatively less efficient, and while Bellingham has a number of vessels that fall within the efficient range, vessels from that area have a much longer travel distance to and from fishing grounds relative to vessels from other ports. This increases cost for those vessels more relative to vessels from other ports suggesting that these vessels may be more appropriately categorized as inefficient.

The effect on Fort Bragg and Crescent city is also somewhat uncertain. While there are several scores that appear to work in Fort Bragg's favour, this community does not score in the top bracket on any of the determinant variables and may have a fleet comprised of inefficient vessels, though several vessels are near the efficient range. Crescent city scores in the negative category on several variables, and positively in others. The overall effect on Crescent city may depend on the relative importance of the variables. If bycatch dependency is the overall, driving factor, then Crescent city may actually be at an advantage even though it has a relatively inefficient fleet and a relatively small amount of quota initially allocated to it.

Port	Fleet Efficiency Score	Bycatch Dependent Area Score	Shorebased Infrastructure	Initial Allocation of Grndfish	Score
ASTORIA	+	+	+ +	+ +	+
BELLINGHAM	?	− −	+ +	+	
BROOKINGS	+	+	−	+	
CHARLESTON (COOS BAY)	+	+	+ +	+	+
CRESCENT CITY	−	+	+	−	
EUREKA	+	+	+	+	+
FORT BRAGG	−	+	+	+	
MORRO BAY	?	+	−	−	
MOSS LANDING	−	− −	+	+	
NEAH BAY	−	− −	− −	−	−
NEWPORT	+	−	+ +	+	
PRINCETON / HALF MOON BAY	−	− −	+	+	
SAN FRANCISCO	−	−	+ +	+	
WESTPORT	−	+	+	−	

The Potential for Geographic Shifts in Fishery Patterns

The regional comparative advantage structure will also influence the geographic nature of fish harvesting activities. When the variables described above are combined, the comparative advantage of different regions will influence the level of fishing effort occurring in the fishing grounds of those ports.

Individual accountability in a rationalization program is likely to result in cleaner fishing practices. In particular, the individual accountability associated with constraining overfished species will encourage vessels to modify gears as well as fish in areas where overfished species are less abundant. In addition, the rationalization program will tend to slow the pace of Olympic style fisheries that exist in the shorebased and mothership sectors of the whiting fishery. Both of these measures will tend to adjust fishing patterns at a geographic level. Cleaner fishing practices are likely to result in some pressure to move away from areas where there are relatively high encounters of constraining species like canary, yelloweye, and cowcod. A rationalized whiting fishery will tend to slow the pace of harvesting and given that the whiting stock tends to migrate north over the course of the year, this is likely to result in more midwater trawl effort occurring further to the north than under an Olympic style fishery. These effects may be enhanced or subdued by the economic activity and efficiency of fishing fleets that focus on certain areas. For example, if the fleet originating in a particular port tends to concentrate their effort in an area with a relatively high abundance of overfished stocks, we would expect that fleet to move or for quota shares from that fleet to be sold to other areas of the coast because it would be more profitable for them to do so[1]. However, if that fleet is relatively efficient and there are shoreside support businesses and infrastructure in ports adjacent to those grounds that make fishing activity in those areas more attractive, vessels may continue to fish in those areas even though constraining stocks are relatively more abundant. This is because the economic efficiency that exists because of an efficient fleet and the presence of shoreside infrastructure can outweigh the effect that a relatively high presence of constraining stocks can have on regional fishing patterns.

Geographic shifts in fishing effort in the non-whiting trawl fishery are assessed by whether a port is at a relative advantage or disadvantage. If a port is at a disadvantage, then it is inferred that their fishing grounds are likely to be trawled less intensively than under status quo. In addition to the port-based comparative advantage structure, areas defined as relatively “high bycatch” are assumed to have less trawl effort than under status quo. This is even if a port is at a relative advantage. The rationale is that ports with a relative advantage may gain trawl activity compared to status quo, but vessels fishing out of those ports are still likely to avoid high bycatch areas in order to avoid constraining stocks and attain higher catch rates of target species. This analysis uses the same information as described in the above section. This information shows that several

[1] Moving or selling quota to another area of the coast would be more profitable in this case because more target species could be accessed per unit of constraining overfished species in a relatively low bycatch area. For example, if vessels can leverage 100 pounds of target species per pound of canary rockfish in one area, but 500 pounds of target species per pound of canary rockfish in another area, more effort would be expected to occur in the second area in order to maximize harvest potential.

areas may be trawled less intensively than status quo including: areas off northern Washington, central Oregon, southern Oregon, and Central California.

<u>Areas Likely to be Trawled Less Intensively than Under Status Quo</u>

- Northern Washington
  – shoreward of the RCA
- Northern and North/Central Oregon – seaward of the RCA
- Central Oregon
  – shoreward of the RCA
- Central California
  – shoreward of the RCA

2. An Analysis Illustrating the Potential to Reduce the Catch Rate of Overfished Species and the Associated Potential for Increased Target Species Catch and Revenue

The reduction in the bycatch rate of overfished species is envisioned as one of the principal outcomes of a trawl rationalization program. One large implication of reductions in the bycatch rate of overfished species is the ability to access more target species and generate higher levels of revenue than under status quo. Under status quo management, fishing opportunities have been reduced to protect overfished species. In some cases, opportunities to catch species that have historically been large targets of the trawl sector have been eliminated because of their relatively high degree of correlation with overfished species (yellowtail and chilipepper rockfish for example). In many cases, those species that are not highly correlated with overfished species have also seen target opportunities reduced. For example, the catch of sablefish (one of the primary targets for the trawl sector) has been less than the total trawl allocation by several hundred tons in recent years and this represents a substantial economic loss in exvessel revenue. It is envisioned that a rationalization program will encourage fishers to operate in a manner that avoids overfished species better than under the command and control type of management that exists in the status quo regime. This expected change in behavior is directly related to the individual accountability aspect of a rationalization program and the fact that there are individual rewards (because of access to target species) that are the result of decreases in the bycatch rate. Some changes in the way fishing opportunities are prosecuted in order to change bycatch rates include changing the location of fishing, changing the gear that is used to prosecute those activities, and changing the time of fishing.

Non-Whiting Fishery Bycatch

Several sources of information exist that can be used to show how the bycatch rate of overfished species can change in a rationalized fishery and the implications of that bycatch rate reduction. This information can be used to modify the NMFS/GMT trawl bycatch model[2] which predicts overfished species catch, target species catch, and exvessel revenue given an estimated overfished species bycatch rate and a set of assumed exvessel prices. By modifying the bycatch rate the model can be used to simulate potential changes in harvest outcomes that will occur in a rationalized fishery. Information that exists to estimate changes in the bycatch rate of overfished species in a rationalized fishery include EFP fisheries have been conducted with requirements that are nearly identical to what would likely be required under a rationalized fishery.

The Washington Arrowtooth Flounder EFP was a project that occurred over 4 years with requirements nearly identical to what would be expected under a rationalized fishery. In this EFP, vessels carried observers and were given an overall cap on the amount of overfished species. Vessels were also given individual vessel limits on overfished species. Vessels that could avoid overfished species and stay within their limits had access to arrowtooth flounder and petrale sole in excess of the normal two-month limits that were in place and had access to areas within the trawl Rockfish Conservation Area. When a vessel reached or exceeded the individual cap, that vessel was no longer allowed to participate in the EFP and was required to fish under normal two-month limits and RCA restrictions while still carrying an EFP observer. In other words, observations were collected while fishing under the EFP and while the vessel was fishing under status quo regulations (the latter serves as the control on the experiment). In addition to information collected on overfished species and target species catch, information on non-marketable discards was collected during the first year of the program. This information can be used to show order of magnitude estimates regarding the amount of regulatory discard occurring under stats quo management and the increased amount of revenue that can be attributed to the fishery via an elimination of regulatory discards.

The information collected when vessels fished outside the EFP is directly comparable to bycatch information collected from the West Coast Groundfish Observer Program in a fishery that is not rationalized, while information collected in the EFP is illustrative of the bycatch rates that would be expected in a rationalized fishery. While the actual bycatch rates collected in this area cannot be used on a coastwide basis (the EFP occurred off northern Washington which has different overfished species interactions than other areas of the coast), the percentage difference between EFP-based observations, and non-EFP observations using the same observers can be used to show the reduction in bycatch rates that can be expected, and to estimate how coastwide bycatch rates collected through the WCGOP should be modified to reflect bycatch under a rationalized fishery.

The figure below illustrates the recorded canary bycatch rates for vessels participating in the EFP by year. The information below shows the bycatch rate when those vessels were participating in the EFP and the bycatch rate when those vessels were fishing under normal (non-EFP) fishing conditions. As is shown from the figure, in 2001 and 2002 the difference in EFP and non-EFP bycatch rates was substantial, while in 2003 and 2004 the difference was less, though still very noticeable. The explanation for this change is

[2] The Trawl Bycatch Model was originally developed by staff at the Northwest Fisheries Science Center for use in setting regulations that manage the non-whiting trawl fishery. This model was reviewed and endorsed by the SSC in 2003.

indicated in the figure. In 2003 gear modifications were required of vessels participating in the EFP and those gears (which had demonstrably lower bycatch rates) were used outside the EFP as well. In 2004 those vessels became more accustomed to using those gears and only gears that had demonstrated "satisfactory" results were used (which further reduced bycatch rates). In 2003 and 2004 the Rockfish Conservation Areas were in place during the months when observations were recorded, thus the bycatch rate for non-EFP observations fell because vessels were no longer fishing in areas with high canary bycatch.

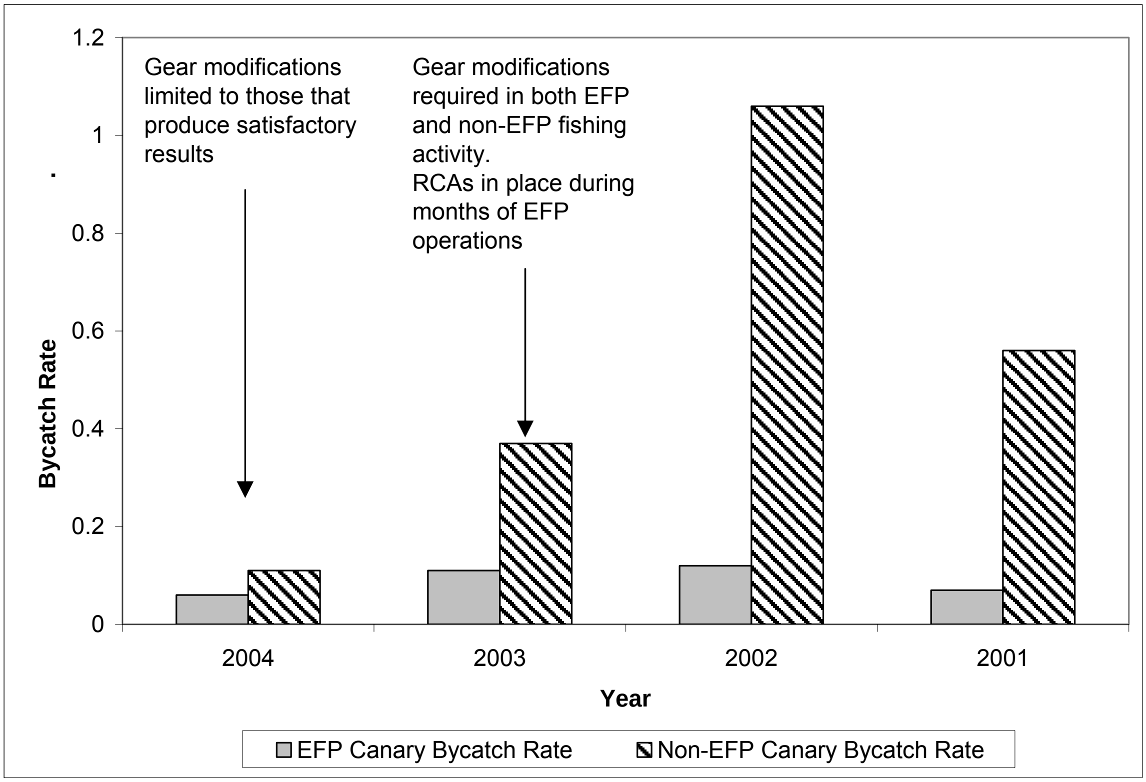
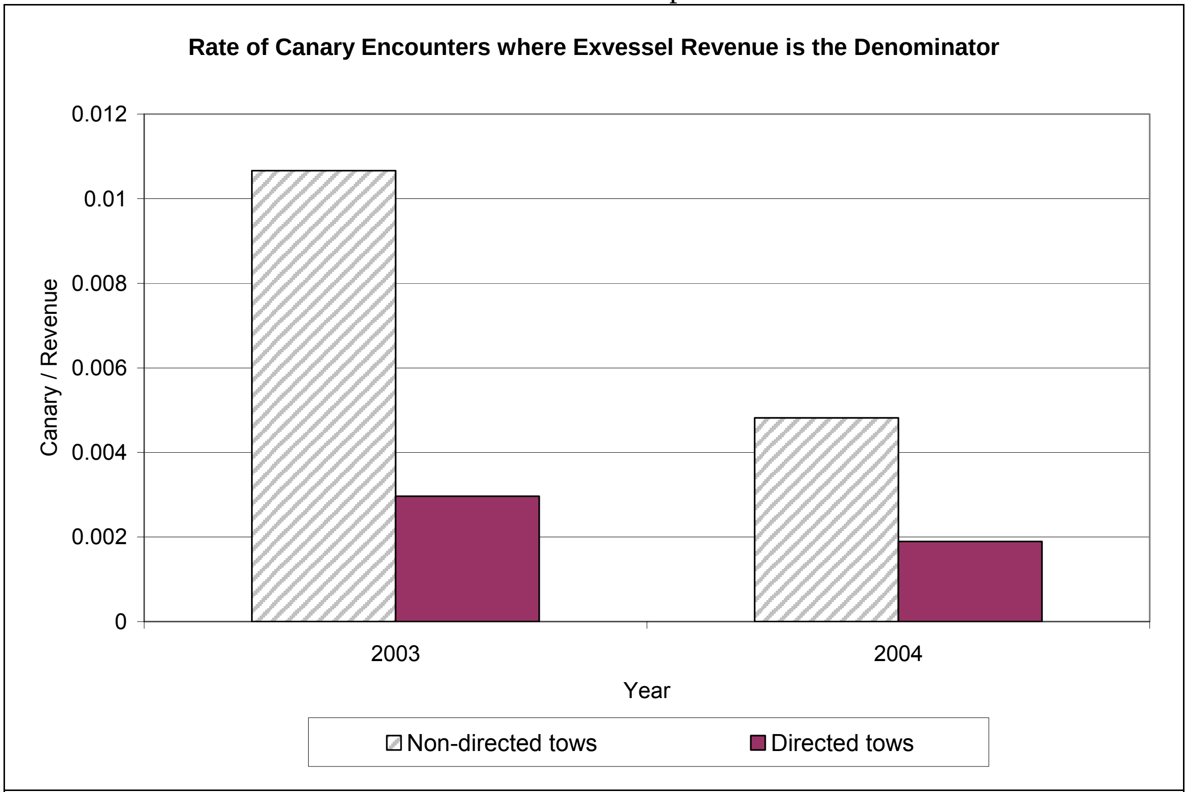
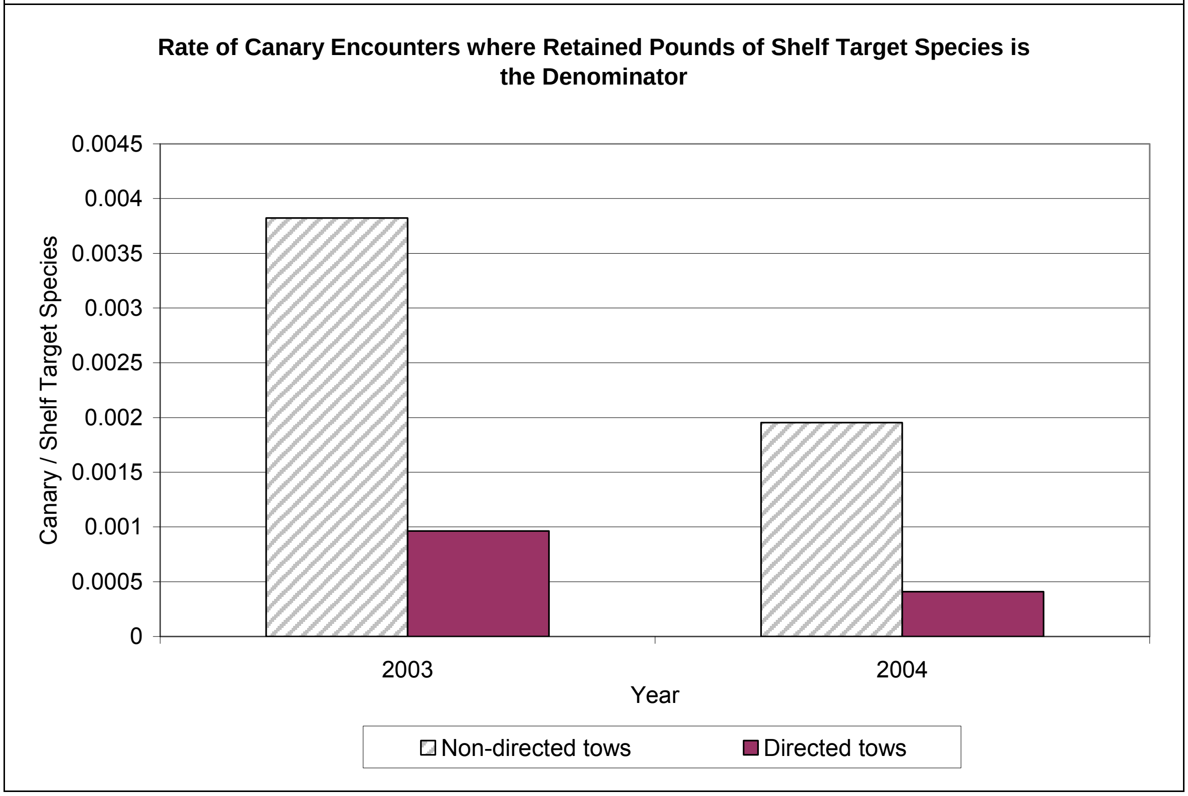
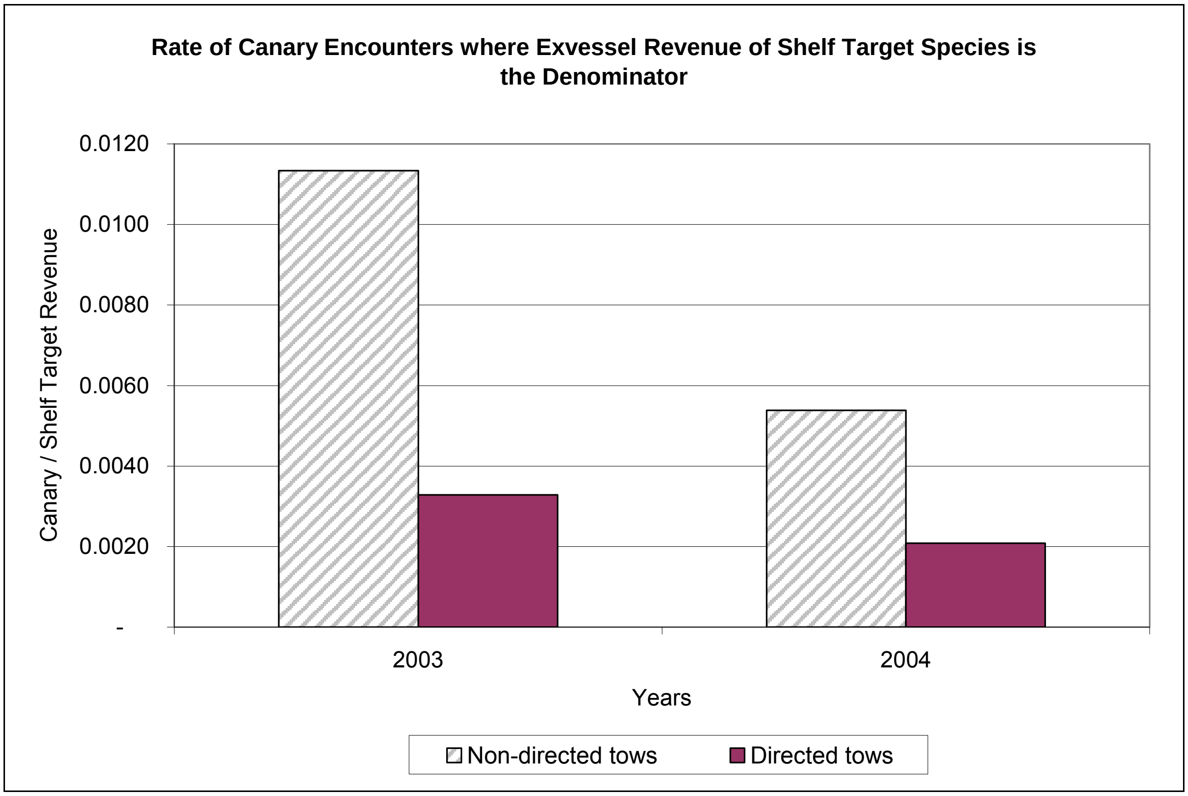


Figure 1 Observed Canary Bycatch Rates in the Washington Arrowtooth EFP

Comments received during the review of proposed methodology questioned whether the bycatch rates in the arrowtooth EFP changed because overfished species were being avoided, or whether they were changing because the denominator, or set of target species, were changing between EFP and non-EFP fishing activity. If the denominator, or set of target species, differs between EFP and non-EFP activity, then the argument was that the results shown above may not be indicative of what could occur under a rationalization program because they could simply be explained by differences in targeting behavior. To examine this question, bycatch rates were estimated in several additional ways: the first method examined canary bycatch relative to the amount of revenue generated by fishing activity; the second method examined canary bycatch relative to the amount of shelf target species; and the third method examined canary relative to the amount of shelf target revenue. All three additional approaches show substantial differences in the bycatch of canary rockfish in directed EFP activity compared to non-EFP activity. Canary rockfish is examined in this case because it was the most constraining species to target fishing activity during the 4 years of the EFP (because of the individual accountability measures of the program). Along other portions of the coast other species such as darkblotched rockfish would likely to be more constraining, and therefore substantial reductions in darkblotched would be expected instead.







Looking further into the data, we compare canary bycatch rates at the haul level and stratify those hauls based on the dominant target strategy[3]. Target strategy is estimated at a species level and is determined based on the species that makes up the majority of catch in a tow. We establish 9 different target species strategies from the project: arrowtooth flounder, Dover sole, petrale sole, "other flatfish", Pacific cod, sablefish, shortspine, arrowtooth and petrale combined, and a mixed target species strategy[4]. Of these we find that the arrowtooth strategy is the largest category by weight for both directed EFP activity and non-directed EFP activity, followed by Pacific cod. The third through sixth largest strategies by weight are the mixed stock strategy, the combined arrowtooth and petrale strategy, the Dover sole strategy, and the petrale strategy, respectively. After categorizing the data in this fashion we compare canary rockfish bycatch rates in directed activity and non-directed activity. At this point it is worthwhile to reiterate that canary rockfish is used because that was the constraining bycatch limit species in this EFP, so canary rockfish was the primary species that fishers were concerned with.
After categorizing data according to a species-specific target strategy, we find insufficient observations to compare directed and non-directed bycatch rates in cases where the haul appears directed at sablefish and shortspine. This is not surprising however, given that shortspine and sablefish are found along deep areas of the continental shelf and along the continental slope, and that the EFP was conducted in areas along the shelf where flatfish are more common. Because there were insufficient observations to compare directed and

[3] Although the EFP was designed primarily to test targeting of arrowtooth flounder (and to a lesser extent, petrale sole), there is evidence in the data to suggest that some hauls were directed at different species.

[4] A mixed target strategy is a tow where there does not appear to be a dominant species caught in the tow

non-directed tows from these species, we do not include a comparison of bycatch rates for these target strategies.

Finally, bycatch rates for canary rockfish were stratified in an additional manner according to whether they occurred in depths outside the RCA or both inside and outside of the trawl RCA. This separation is intended to isolate the effect of bycatch reduction measures that could be implemented via regulation (implementation of an RCA) from those bycatch reductions that would occur because of fisherman behavior. We do not show a comparison of directed and non-directed activity within the RCAs because non-directed activity was conducted according to regular management measures, and therefore data does not exist on non-directed activity within the RCA. We do, however, compare directed EFP activity that occurred in all areas (both inside and outside the RCA) with non-directed activity outside the RCA. This is intended to provide an order of magnitude estimate that compares the effect on bycatch reduction from fishermen behavior versus a bycatch reduction as a result of regulation. This comparison is labeled in the following table as “Inside and Outside RCA”.

The following table shows the result of the categorizations described above. This table shows canary bycatch rates by directed EFP activity and non-directed activity. That data is further stratified according to bycatch rates that occurred by target species strategy outside the RCA and a comparison of target species strategies for all areas (directed EFP activity took place within and outside the RCA). This data shows that for all target strategies listed, the bycatch rate of canary rockfish was lower in directed-EFP activity in every case except when petrale sole target tows in directed EFP activity that occurred inside the RCA are included in the comparison. This suggests that fishermen behavior was more effective at reducing bycatch than regulatory mechanisms in all cases except for when those vessels targeted petrale sole. In the case of petrale sole targeting, fishermen behavior would tend to reduce the bycatch rate of canary rockfish (as shown in the comparison between directed and non directed activity outside the RCA), but the implementation of RCAs would result in a lower canary bycatch rate during petrale sole targeting activity than relying on fishermen behavior alone.

Table 5 Canary Bycatch Rate in Arrowtooth Flounder EFP by Target Strategy and Relation to RCA

STRATEGY	NON-DIRECTED BYCATCH RATE OUTSIDE RCA	DIRECTED BYCATCH RATE OUTSIDE RCA	DIRECTED INSIDE AND OUTSIDE THE RCA
MIXED SPECIES STRATEGY	0.011	0.000	0.001
ARROWTOOTH/ PETRALE	0.003	0.002	0.002
PACIFIC COD	0.002	0.001	0.001
DOVER SOLE	0.001	0.000	0.000
PETRALE	0.002	0.000	0.003
ARROWTOOTH	0.002	0.001	0.001

The data used from the Arrowtooth EFP project compares observed bycatch rates that occurred in depths that are outside (deeper or shallower than) the trawl Rockfish Conservation Area. Including observations outside the RCA is consistent with the expectation that RCAs will remain in place under a rationalization program and also provides a more direct comparison between a rationalized fishery and status quo management (which relies on RCAs). This involves using observations from 2003 – 2004 that occurred outside the RCA. The percentage difference between EFP and non-EFP rates are applied to coastwide bycatch rates estimated from the West Coast Groundfish Observer Program. These modified rates are then used in the NMFS/GMT bycatch model for estimating the change in target species catch and exvessel revenue that would be expected in a rationalized fishery given the expected reduction in the encounters of constraining overfished species.

It is important to note the uncertainty associated with using the Arrowtooth EFP data in a manner for predicting coastwide changes in the bycatch rate. While available information clearly shows that changes in the bycatch rate of constraining stocks should be expected to occur under a rationalized fishery, the degree to which the quantitative results can be extended along the entire coast is uncertain. It is likely that other areas of the coast will be constrained by a different set of overfished species than the northern Washington coast (where the EFP was conducted) and it is not entirely clear how bycatch rates will change when another species is the constraining factor on target opportunity. For example, darkblotched rockfish do not tend to aggregate in the same fashion as canary rockfish {Steve Parker, personal communication}, and therefore a different approach may be necessary in order to avoid darkblotched compared to canary rockfish which tend to aggregate to a greater degree. Furthermore, bycatch rates in status quo management are representative of status quo fishing opportunity. Using the EFP results to modify bycatch rates collected under the status quo regime may be reasonable to inform bycatch rate associated with species that are currently targeted such as flatfish, sablefish, and thornyheads. The bycatch rate associated with species that are not currently targeted (such as chilipepper and yellowtail rockfish) is not well understood, and therefore the change in the bycatch rate associated with these species that should be expected in a rationalized fishery is also not well understood. In light of these uncertainties, the prediction of coastwide catch and exvessel revenue is displayed as a range, and that range should be treated as an order-of-magnitude.

In addition to the change in target species catch that may occur as a result of changes in bycatch rates, the catch of one target species may be limited by the catch of another target species. This is particularly the case for target species that co-occur with sablefish and petrale sole because these two species are caught at levels near their OY under status quo management. In other words, any increase in co-occurring stocks will mean successful avoidance of sablefish and petrale to some degree, to facilitate increased catch of co-occurring target species. Based on available information, the target species most limited by sablefish and petrale sole are “other flatfish”, Dover sole in areas seaward of the RCA, shortspine thornyheads to some degree, and arrowtooth flounder to some degree. To assess the likely change in the co-occurrence of target species catch, we turn to recent patterns of landings and discard relative to catch limits, permit specific fish tickets, and the expertise of analysts that have been involved in structuring and proposing fishing opportunity for the limited entry trawl fleet. Based on these data sets and information, it appears that the "other flatfish" category, Dover sole, and thornyheads are limited by the OYs of petrale sole and sablefish, though increases in the catch of those species still occur under a rationalization program. The following table shows a range in the modeling results which are meant to bracket the range of uncertainty, but also to provide target species catch estimates that are within a realistic order-of-magnitude.

Table 6 Estimated Catch of Select Groundfish in the Non-Whiting Trawl Sector by Bycatch Reduction Scenario

Species	Low Catch	Med Catch	High Catch
Sablefish	2,371	2,371	2,371
Longspine	2,071	2,071	2,071
Shortspine	1,536	1,536	1,536
Dover	11,985	11,985	15,000
Arrowtooth	4,943	4,943	4,943
Petrale	2,223	2,223	2,223
Other Flatfish	2,547	2,547	4,800
Yellowtail	51	51	1,000
Chilipepper	46	2,000	2,000
Pacific cod	723	1,200	1,200
Lingcod	220	670	855
Slope Rockfish	680	1,120	1,120

Pacific Whiting Fishery Bycatch

It is likely that overfished species bycatch rates will also change in the mothership and shorebased sectors of the whiting fishery because those fisheries are operating as an Olympic fishery under status quo management. The whiting fishery operates under sector-wide bycatch limits that can close all sectors of the fishery if reached. Each sector has demonstrated a reduction in bycatch rates since bycatch limits were put in place, however the catcher-processor sector has demonstrated a lower rate of canary rockfish bycatch (the species that was most constraining from 2004-2006). From this information, we can infer that changes in the bycatch rates in the mothership and shorebased sectors of the whiting fishery are likely to occur if those sectors of the fishery are rationalized. It is important to note that it is not appropriate to assume the mothership and shorebased sectors of the whiting fishery would have the same bycatch rates as the catcher processor sector.

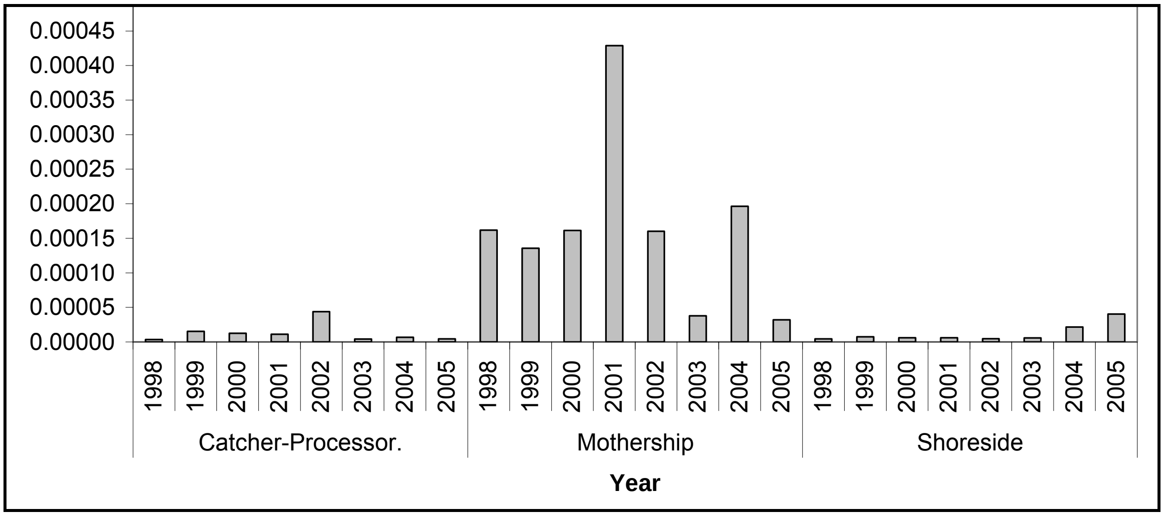


Figure 2 Canary Bycatch Rate by Year and Whiting Sector

While it appears that bycatch rates in the mothership and shorebased sectors of the Pacific whiting fishery may decrease as a result of rationalization, such decreases are not expected to result in the same effect on the fishery as in the non-whiting fishery. Namely, the quantity of Pacific whiting harvested in the fishery has not been historically constrained by overfished species, with the exception of the 2007 season. Therefore, reductions in the bycatch rate of overfished stocks in the shoreside and mothership whiting sectors may not have an overall, aggregate economic impact in and of itself, though it is likely to change the behavior of harvesters in this fishery. Such behavior may have an indirect effect on the economics of the fishery if, for example, the timing of the fishery changes in order to respond to bycatch concerns.

Overview of Select Analysis

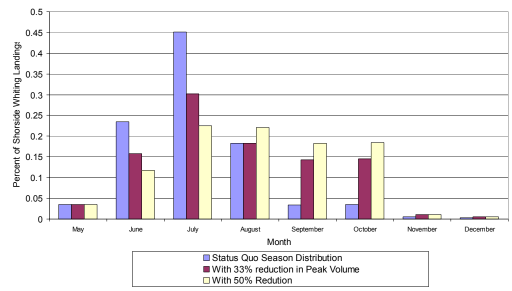
Analysis Shows Several Expected Effects of Rationalization

- Fleet consolidation in shoreside whiting, mothership whiting, and non-whiting sector
- Change in season length in SS and MS whiting
- Increased harvest of non-whiting groundfish
- Consolidation of processing capital in shoreside whiting and mothership whiting fishery, but expansion in non-whiting
- Potential for changes in negotiation power between harvesters and processors
- Potential for geographic shifts in fishery and delivery patterns in non-whiting sector
- Risks to harvesters from coverage of low OY or low allocation species with IFQ
- Gear switching in non-whiting trawl sector to target sablefish

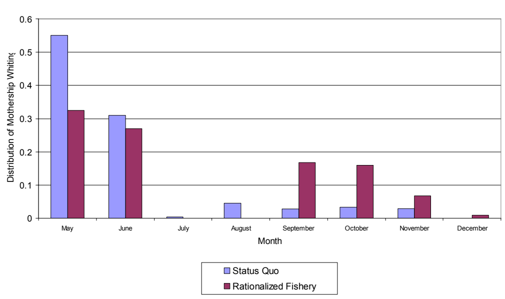
Fleet Consolidation

- Non-whiting: from 100-120 to 40-60 vessels
- Shoreside whiting: from 37 – 23 vessels
- Mothership whiting: from 20 – 14 vessels

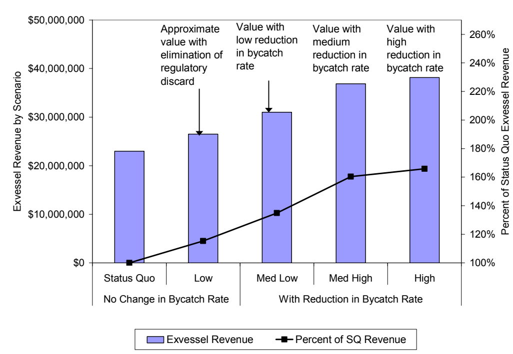
Timing and Distribution of SS Whiting Fishery



Timing and Distribution of MS Whiting Fishery



Increased Harvest and Gross Revenue in Non-Whiting



Processor Consolidation

- Shoreside whiting: need for processing capital may decline by 30 – 50%
- Mothership whiting: need for processing capital may decline by 40%
- Non-whiting: need for processing capital may increase by 12 – 35%

7

Exvessel Prices

- Appears exvessel prices in shoreside whiting sector have the potential to change more than in other sectors
- Exvessel prices may change in non-whiting to some degree, though not to the same degree as shoreside whiting
- May be cases where prices in mothership sector change. Vertical integration and BSAI pollock relationships may temper this effect.

8

Geographic shifts in fishing and delivery location

Port	Fleet Efficiency Score	Bycatch Dependent Area Score	Shorebased Infrastructure	Initial Allocation of Grndfish	Score
BELLINGHAM	?	– –	+ +	+	
NEAH BAY	–	– –	– –	–	–
WESTPORT	–	+	+	–	
ASTORIA	+	+	+ +	+ +	+
NEWPORT	+	–	+ +	+	
CHARLESTON (COOS BAY)	+	+	+ +	+	+
BROOKINGS	+	+	–	+	
CRESCENT CITY	–	+	+	–	
EUREKA	+	+	+	+	+
FORT BRAGG	–	+	+	+	
SAN FRANCISCO	–	–	+ +	+	
MOSS LANDING	–	– –	+	+	
PRINCETON/HALF MOON BAY	–	– –	+	+	
MORRO BAY	?	+	–	–	

9

Risks from Low OY or Low Allocation Species

- May constrain harvest activity and place a large burden on individuals if such species are encountered
- Many of these stocks do not have a conservation concern
  - Nearshore groundfish
  - Flatfish in whiting sectors

10

Gear switching

- Appears non-whiting trawlers may switch gears to target sablefish
  - May increase revenue in the aggregate
  - May decrease exvessel prices for FG sablefish by ~1%
  - May result in grounds competition
  - Provides more tools to IFQ holders to balance quota accounts and manage bycatch

11

Cooperatives or IFQs for the Whiting Sectors?

12

Co-ops or IFQs?

Why might the Council establish an IFQ system or a system of cooperatives?

- Several factors play into the consideration including:
  - Relative degree of administration for implementing co-ops or IFQs
  - Establish co-ops in regulation, or allow voluntary formation without a regulation?
  - Impose a high degree of individual accountability for OFS (IFQ), or spread the risk across multiple harvesters (co-ops)
  - The risk associated with the presence of a non-cooperative sector
  - Characteristics of participants in each sector

13

	IFQ Characteristic and Compatibility	Co-op Characteristic and Compatibility
Market Characteristics	Better in well functioning markets	Better at dealing with less well functioning markets
Resource and Management complexity	Better in simple systems	More adept at dealing with – and evolving into – complex systems
Economic practices	Participants focus on profitability and innovation	Participants have more perspective on long-term stability and risk sharing
Social structure	Loose and stranger relations among participants	Close knit relations among participants
Ability to deal with new entrants	Better able to deal with new entrants	Not as adept at dealing with new entrants

14

Characteristics of fishery participants and their importance

Self-motivated harvesters

- Tend to harvest more of a collective resource
  - May find it difficult to agree to catch sharing arrangements in a coop system
  - May exacerbate derby conditions in the non-coop portion of a co-op fishery

Socially-motivated harvesters

- Operate in a manner that achieves a more collective outcome
  - Find it relatively easy to agree on catch sharing arrangements
  - More likely to continue operating in a collective manner if engaged in the non-co-op fishery

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Characteristics of fishery participants and their importance (cont)

Objectives and Similarities of Harvesters:

- Harvesters with similar capacities and objectives may find it easier to reach collective agreements
- Harvesters with dissimilar capacities and objectives may not be able to reach agreement

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Characteristics of fishery participants and their importance (cont)

Power and status among harvesters:

- Groups with power and status imbalances face difficulty reaching sharing agreements
- Imbalances can be solved by making sharing agreements for them (issuing IFQs or issuing “catch histories” in a coop program)

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Characteristics of fishery participants and their importance (cont)

Group size:

- It is more likely that small groups will form collective relations
- Smaller group size makes it easier for participants to monitor and self-enforce one another
- Smaller group size enhances communication

18

Regulatory Co-ops vs Voluntary Arrangements

Regulatory Co-ops
- Guarantees groups will form, leading to relations that can manage risky, complex situations
- Requires there be a high degree of certainty that harvesters can coordinate effectively and find mutually beneficial objectives

Voluntary Co-ops
- Small, similar fleets may not need regulation to form co-ops, though they may be appropriate
- Large, diverse fleets may not operate effectively if co-ops are forced on them
  - May form arrangements among small sub-groups voluntarily

Characteristics of Sectors

C-P
- Relatively few entities
- Similar capacity
- Similar objectives

Mothership
- More entities than CP
- Somewhat similar capacities
- Different catch histories
- Similar objectives

Shoreside whiting
- More entities than CP or MS
- Varying capacities
- Different catch histories
- Both varying and similar objectives

Non-whiting
- Largest number of entities
- Wide array of capacities
- Highly different catch histories
- Varying objectives and targets

Catcher – Processor Sector

- Has operated under the voluntary cooperative for several years
  - This voluntary cooperative acts like a rationalized fishery
- Some potential for this cooperative to break apart under specific circumstances
  - Especially if another sector can affect the C-P sector
- "Learned behavior" suggests potential for break-up is relatively small
  - Participants have participated in Olympic fisheries and know the cost associated with breaking-up the coop.

Mothership Sector

- More vertical integration than other non-CP sectors
  - Means infrequent occurrences of catcher vessels switching motherships
    - Means relatively infrequent participation in non-coop fishery
- Many relationships in MS sector appear to be extensions of relationships from BSAI pollock.
- Approximately 20 catcher vessels in any given year
- 12 MS catcher vessels also participated in SS whiting from 2004-2006

MOTHERSHIP CATCHER VESSEL	QUALIFIED MOTHERSHIP PROCESSING CO.	2004	2005	2006
1	supreme alaska	X	X	X
2	premier pacific		X	X
3	supreme alaska		X	X
4	premier pacific		X	X
5	american seafoods			X
6	premier pacific		X	X
7	arctic storm	X	X	X
8	premier pacific			X
	arctic storm		X	
9	supreme alaska	X	X	X
10	american seafoods		X	X
	arctic storm	X	X	X
11	supreme alaska	X	X	X
12	arctic storm	X	X	X
13	arctic storm			X
14	arctic storm		X	X
15	american seafoods	X	X	X
16	premier pacific			X
	arctic storm			X
17	american seafoods			X
18	arctic storm	X	X	X
19	american seafoods		X	X
20	american seafoods	X		
21	arctic storm	X	X	X

Shoreside Whiting

- Least amount of vertical integration
- More participants than CP or MS sector
  - Participants appear more diverse: some participate in non-whiting, others in MS sector
  - Approximately 37 different catcher vessels from 2004-2006
    - 12 participate in MS sector. 27 in non-whiting sector
- Less concentration of processing activity than MS sector

		YEAR		
SS CATCHER VESSEL	SHORESIDE WHITING BUYER	2004	2005	2006
A	OCEAN GOLD SEAFOODS INC			X
B	PACIFIC	X	X	
	BORNSTEIN			X
	DA YANG			X
	JESSIES ILWACO FISH CO INC			X
C	OCEAN GOLD SEAFOODS INC	X	X	X
D	PACIFIC		X	
	OCEAN BEAUTY	X	X	X
E	JESSIES ILWACO FISH CO INC			X
F	PACIFIC	X	X	
	BORNSTEIN			X
G	PACIFIC	X	X	X
H	PACIFIC		X	X
I	PACIFIC	X	X	X
	JESSIES ILWACO FISH CO INC			X
J	PACIFIC			X
K	PACIFIC	X		
	OCEAN GOLD SEAFOODS INC		X	X
L	PACIFIC	X		
	DEL MAR		X	
	OCEAN GOLD SEAFOODS INC	X	X	X
M	BORNSTEIN			X
	DA YANG			X
N	TRIDENT	X	X	X
O	PACIFIC	X		X
	TRIDENT	X	X	
P	PACIFIC	X	X	X
	SHORELINE		X	
	WF ALBER	X		X
Q	TRIDENT	X	X	X
R	PACIFIC	X		
	TRIDENT	X	X	X
S	JESSIES ILWACO FISH CO INC		X	X
T	OCEAN GOLD SEAFOODS INC	X	X	X
U	JESSIES ILWACO FISH CO INC	X	X	X
V	PACIFIC	X	X	X
W	OCEAN GOLD SEAFOODS INC	X	X	X
X	DEL MAR			X
	DEL MAR			X
	OCEAN GOLD SEAFOODS INC			X
Y	DA YANG			X
	DEL MAR			X
	JESSIES ILWACO FISH CO INC			X
Z	PACIFIC	X	X	X
	DEL MAR		X	

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3 versus 4 Sectors

- Related to IFQs or Coop Decision because:
  - If coops are established for SS whiting, we can only have 4 sectors

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Considerations for 3 versus 4 Trawl Sectors

- Can one sector dominate another financially?
  - Could acquire OFS quota and restrict the opportunities in the other
- Will the creation of 4 sectors create barriers that operate as a constraint on fishing activity?
  - Under 3 sector option, entities can use the market to trade quota and avoid a constraining situation
  - Under 4 sector option, entities are restricted to the allocation made to their sector

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Can one sector dominate another financially?

- Argument that SS whiting participants make more money, leading to better capability of purchasing quota
  - Analysis indicates non-whiting trawlers will generate substantially more under rationalized conditions
    - Non-whiting participants will take home over $300K on average after expenses and wages

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Will 4 sectors operate as a constraint?

- Information shows bycatch of sablefish in SS whiting varies substantially from year to year
  - In years where bycatch is high, SS whiting harvesters may be constrained by sablefish
  - In years where it's low, that sablefish may not be harvested, leading to lost economic opportunity

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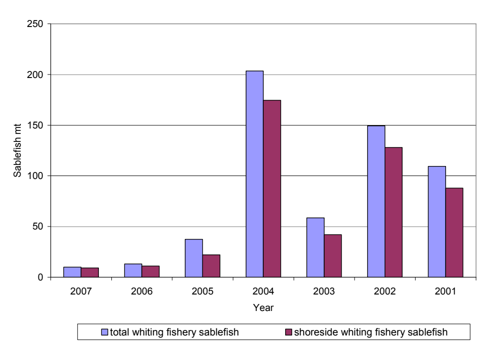
Bycatch of Sablefish in Whiting Sectors



30

Additional Considerations

- When widow become rebuilt, will non-whiting harvesters need more whiting quota in order to prosecute that fishery?
  - One possible option is to re-allocate some whiting to non-whiting sector through a Council process (under 4 sectors)
  - Another option is to allow that reallocation to occur through the market (under 3 sectors)

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Initial Allocation to Processors, Processor Linkages, or Adaptive Management for Processors

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Processor Linkages (harvester-processor relationships)

- Processor linkages:
  - Result two strong and mutually dependent entities involved in negotiation
    - Outcome is the sharing of profits being between harvesters and processors
  - As percent of processor linkage decreases, harvester negotiation power increases
  - As percent of linkage decreases, probability of catcher vessel going into non-coop to break linkage decreases
  - May foster stability in relations between harvesters and processors, leading to stable fishing practices
  - May have some asset value if a processor has a permit that can be transferred with linkages attached

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IFQs (harvester–processor relationships)

- Theory suggests that the holder of quota will assume much of the profit associated with harvesting and processing
  - Harvesters with quota will bid up exvessel prices from processors, decreasing processor profitability
  - Processors with quota will bid down exvessel prices, decreasing harvester profitability
- Empirically, both harvesters and processors may exert some influence over prices
  - Harvesters can form FCMA bargaining groups and essentially act as a single entity when negotiating prices
  - Processing is concentrated into a few entities, which tends to reduce the amount of competition between processors for deliveries from harvesters

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Adaptive Management for Processors (harvester-processor relationships)

- If adaptive management is distributed to select processors that have demonstrated harm then:
  - Adaptive management appears to benefit those processors that are recipients
    - May provide a reasonable expectation to those processors about deliveries
    - May allow those processors a greater ability to negotiate with harvesters over prices
  - Adaptive management does not appear to create an “asset” like IFQ or processor linkages appear to

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How Will Rationalization Affect Harvester-Processor Relationships in Shoreside Whiting, Non-Whiting, and Mothership Sector?

Executive Summary:

- Assuming harvesters receive all quota share, or catch history without a processor linkage, then:
  - Appears exvessel prices in shoreside whiting may increase relatively more than MS or non-whiting
  - Appears non-whiting exvessel prices may increase, but not to the same degree as SS whiting.
  - Mothership sector exvessel prices may be moderately affected, or on a case by case basis
- Explanation to follow

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Shoreside Whiting Sector

- Existing structure is generally an Olympic fishery
  - Under this structure, harvesters have difficulty forming and maintaining FCMA bargaining arrangements
    - If harvesters form a bargaining group, there is a large incentive for harvesters to “cheat”
  - 5 relatively large processors compete for deliveries with new processors entering in recent years
    - Exvessel price appears to follow export price, suggesting harvesters are able to exert some leverage under status quo

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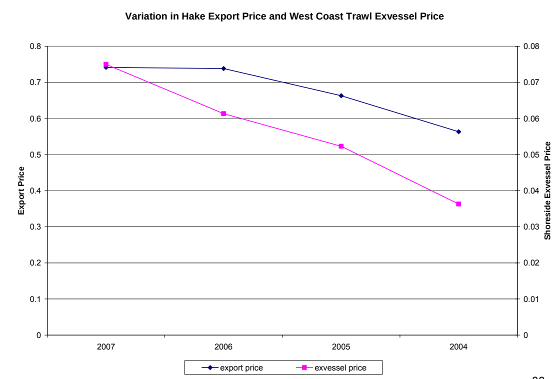

38

Effect of Rationalization on SS Whiting Industry Relationships

(if 100% QS given to permits)

- Will make it relatively easy for harvesters to form and maintain bargaining groups (less incentive to “cheat” under rationalized conditions)
- Stronger bargaining groups among harvesters plus competition among processors suggests exvessel prices will increase in SS whiting fishery if 100% quota given to harvesters

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Non-Whiting Trawl Sector

- Existing structure is not an Olympic fishery, but rather a system of 2-month quotas
  - Under this structure, the formation of FCMA bargaining groups is relatively easy
    - Less incentive to “cheat”
    - Group formation may break down as end of 2-month limit approaches

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Non-Whiting (continued)

- 3 processors purchase majority of landings with little new participation or re-investment in recent years
  - Unclear whether exvessel price follows export price, questioning whether harvesters are able to exert leverage under status quo
  - Non-whiting harvesters make zero economic profit, suggesting that (if processors are generating profit) harvesters have very little negotiating power
- At least some harvesters are on “rotation assignments” from processors
  - Suggests some processors may have more influence over harvesting activity than vice versa

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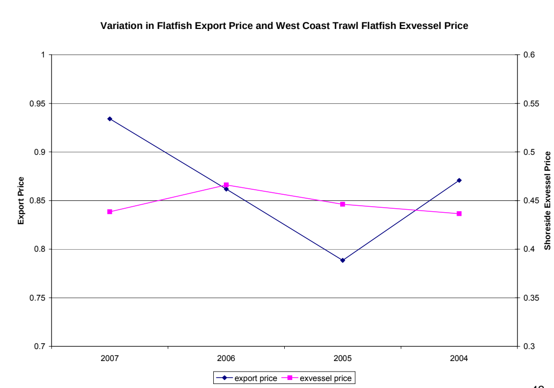

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Effect of Rationalization on Non-Whiting Industry Relationships
(if 100% QS given to harvesters)

- Improve the negotiating power of harvesters because of increased time horizon to "hold out" against processors
  - May improve bargaining position less than SS whiting because:
    - Harvesters already have a greater ability to form negotiating groups in non-whiting compared to SS whiting
    - Processing appears to be more concentrated into fewer companies than in SS whiting

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Mothership Sector

- Existing structure is an Olympic fishery, but with more vertical integration than in other sectors
  - For those harvesters not vertically integrated, Olympic fishery makes it difficult to form FCMA bargaining groups
- 6 companies have purchased MS whiting in recent years, with 3 purchasing the majority
- Relationships in MS sector may be influenced by relations that exist in BSAI pollock fishery
  - Negotiations between harvesters and motherships appear to occur in some instances, while profit sharing arrangements may occur in others

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Effect of Rationalization on Mothership Whiting Industry Relationships (if 100% QS given to harvesters)

- Vertically integrated processors will be able to "hold out" against non-vertically integrated harvesters
- Exvessel prices unlikely to change to the same degree as in SS whiting
  - mothership processors not vertically integrated may pay more while those that are vertically integrated may not

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Factors that may help determine whether and to what degree compensation should be given to processors

- What is negotiating power under status quo?
- How much vertical integration exists (how many permits owned by processors)?
  - And how much quota will be received from those permits
- What degree of processor consolidation may occur?

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Where are we starting from?

- SS whiting: harvesters appear to have leverage over exvessel prices under status quo.
  - 5 large processors compete for deliveries
  - Exvessel price follows export price
- Non whiting: harvesters appear to have less leverage over exvessel prices under status quo than in SS whiting.
  - 3 large processors exist
  - Harvesters are put on rotations from processors
- Mothership whiting: Harvester-processor negotiations not clear and/or case dependent
  - Relatively vertically integrated sector.
  - Harvester-processor relationships appear to be influenced in many instances by BSAI pollock relationships.
  - 3 large processors exist.

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Vertical Integration as a Factor Influencing Initial Allocation

- Vertical integration means exvessel price negotiation is irrelevant in some cases (processors pay themselves for fish)
- Vertical integration allows processors to "hold out" against harvesters
- More vertical integration may diminish argument for an initial allocation to processors

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SS Whiting: Vertical Integration

- 3 permits owned by processing companies
  - Less than 10% of active vessels in any year
- These 3 permits comprise approximately 5.7% of shoreside whiting harvest in recent years
  - May receive 3.7% of initial allocation

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Non-Whiting: Vertical Integration

- 17 permits owned by processing companies
  - Represents 14 – 17% of active vessels in any year
- Recent landings represent approximately 9% of sector landings
  - These permits may receive up to 11.6% of initial allocation

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Mothership Whiting: Vertical Integration

- 5 permits owned by processing companies
  - Approximately 25% of vessels in any year
  - Anecdotal information also suggests partial ownership of vessels by processing companies exists
- Recent catch of 5 permits represents approximately 27% of sector catch in recent years
  - These permits could receive up to 22% of initial allocation

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Consolidation as a Factor Influencing Initial Allocation

- Capital consolidation means less equipment is necessary to process same quantity
- Less equipment may decrease production costs (potentially increasing profit)
- May diminish the value of assets held by processors
- Effect of consolidation must be considered simultaneously with price negotiation
  - Combined effect determines whether decreased use of assets is to the detriment, or benefit, of processors

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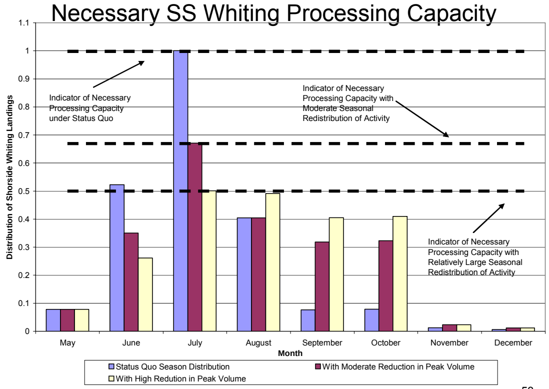
Necessary SS Whiting Processing Capacity



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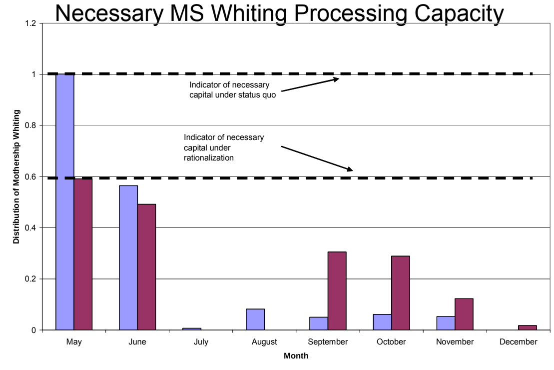
Necessary MS Whiting Processing Capacity



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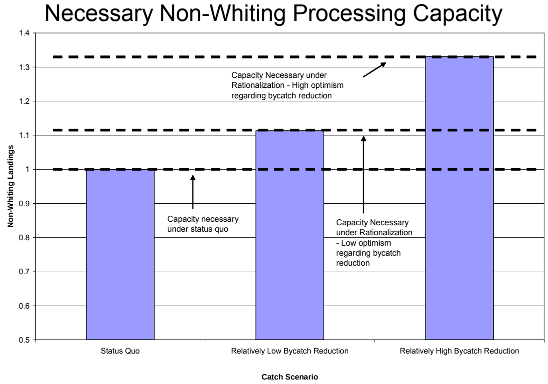
Necessary Non-Whiting Processing Capacity



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Summary of Processing Capacity Needs after Rationalization

- SS whiting: may decrease ~30% – 50%
- MS whiting: may decrease ~40%
- Non whiting: may increase ~12% – 35%

- Each above scenario can decrease processor production costs.
  - Decreased production costs can be beneficial to processors if they have some negotiation power
  - If processors do not have negotiation power, harvesters will simply leverage higher exvessel prices and processors may not benefit
  - Some processors may be adversely affected by consolidation, others may benefit

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Concluding Remarks on Harvester – Processor Allocations

- SS whiting industry:
  - Likely to consolidate in both harvesting and processing
  - Highest potential of exvessel prices shifting toward the harvesters favor if all QS granted to permits
- Non-whiting industry:
  - Harvesters are likely to consolidate, while processing expected to expand
  - Exvessel prices may shift somewhat toward harvesters favor if allocated to permits, but not as much as in SS whiting and from a less advantageous starting point
- MS whiting industry:
  - Likely to consolidate in both harvesting and processing
  - Exvessel prices may shift moderately toward harvesters favor. Tempered by vertical integration and BSAI pollock relationships

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Adaptive Management

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Assessed based on following potential goals:

- Community protection
- Incentives for bycatch reduction
- Incentives for habitat and bycatch friendly gear

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Community protection

- Unclear how and whether AM for community protection would work in at-sea sectors
  - Processing and harvesting activity takes place at sea
  - Harvesters and processors alike are heavily tied to Puget Sound region
- Could achieve community protection in SS whiting and non-whiting

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Incentives for Bycatch Reduction

- AM used for bycatch reduction may be most appropriate for species not covered with IFQ/IBQ/coops
  - Example: Salmon → could be appropriate for all sectors
  - Bycatch reduction for species covered with IFQ/IBQ/coops may be more effective through direct management

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Incentives for Gear Switching/ Modification

- Gear switching/modification may not be appropriate in at-sea sectors unless used to stimulate bycatch reduction
  - Midwater trawl is off bottom. Impractical to target whiting without trawl gear
- Incentives for gear switching/modification may be more appropriate for non-whiting trawl fishery
  - May be appropriate to target some non-whiting species with non-trawl gear

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Species Covered with IFQ or Managed in Cooperatives

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Overview

- Several analyses and presentations have mentioned the implications of managing OFS with IFQ
  - High cost of purchasing that quota if one goes into a deficit
  - May be difficulties in finding quota on the market
  - Some possibility that a "disaster tow" could be large enough to take the sector allocation
    - This could pre-empt others
  - Possibility of "thin market" conditions
    - Catch may be relatively small, but prices may be highly variable. Leads to cases where entities pay high prices for quota

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Extends beyond overfished species

- Analysis reveals that several stocks may pose this constraint in addition to overfished species
  - Nearshore groundfish
    - Minor nearshore, black rockfish, cabezon, kelp greenling, and others
  - Flatfish, minor shelf rockfish, and others in the whiting sector
  - And more
- Same conservation need may not exist as for overfished species, yet same burden may be placed on harvesters

(Assumes allocations made to sectors are similar to SQ catch levels)

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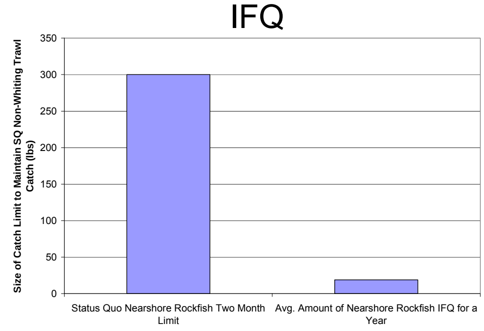
Example: SQ Nearshore Rockfish 2-month Limit vs Annual QP under IFQ



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Catch of Select Nearshore Species in Non-Whiting and SS Whiting Trawl Sector

	2006		2005		2008 OY
	Non-Whiting Trawl	Whiting Trawl	Non-Whiting Trawl	Whiting Trawl	
Black rockfish	5	0	1	0	1,262
Other Nearshore rockfish N	3	0.1	1	0	142
Other Nearshore rockfish S	0	0	0	0	564
Cabezon	0	0	0	0	69
Kelp greenling	0	0	0	0	NA

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Catch of Select Species in the At-Sea Sectors

SPECIES NAME	2005	2006	2007
ARROWTOOTH FLOUNDER	3.6	2.8	3.0
BLACK ROCKFISH	0.0	0.0	0.0
BLUE ROCKFISH		0.0	
DOVER SOLE	0.4	0.0	0.1
ENGLISH SOLE	0.1	0.0	0.0
FLATHEAD SOLE	0.0	0.0	0.0
KELP GREENLING	0.0	0.0	
PETRALE SOLE			0.0
REX SOLE	3.2	0.3	0.3
SLENDER SOLE	0.0	0.0	0.0

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List of Non-OFS Species in ABC/OY Table for Which IFQ or Coop Coverage May not be Necessary

Non-Whiting Fishery (shoreside fishery if 3 sectors)	Whiting Fishery
Longspine S 34°27'	Lingcod S of 42° N. latitude
Minor Nearshore Rockfish N	Pacific Cod
Minor Nearshore Rockfish S	Pacific Ocean Perch
Black Rockfish (WA)	Chilipepper
Black Rockfish (OR-CA)	Splitnose
California Scorpionfish	Shortspine
Cabezon	Longspine
Kelp Greenling	Black Rockfish (WA)
Shortbelly	Black Rockfish (OR-CA)
?Other Rockfish?	Minor Nearshore Rockfish N
?Minor Shelf Rockfish?	Minor Nearshore Rockfish S
	California Scorpionfish
	Cabezon
	Dover Sole
	English Sole
	Petrale Sole
	Arrowtooth
	Starry Flounder
	Other Flatfish
	Kelp Greenling
	Shortbelly
	Longnose Skate
	?Other Rockfish?
	?Minor Shelf Rockfish?

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Possible Approaches other than IFQ or Coop coverage

- Do not directly manage
  - Take some "off the top" in inter-sector allocation process and monitor catch levels
    - Currently done in whiting fishery
    - Gear switching may mean targeting of nearshore species without a limit
- Retain cumulative catch limits
  - Could be total catch based to retain individual accountability
    - Done under status quo
    - Retains a catch control tool with less burden on individuals, but also less individual accountability

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Factors Affecting the Ability for the Industry to Manage Risk

Voluntary "risk pools" are one way of managing the catch of such high-risk species in an IFQ program:

- Voluntary agreements depend heavily on several points:
  - That participants in those agreements be relatively balanced in their negotiation power
  - That participants in those agreements be few enough in number that they can agree

Initial allocation, grandfather clauses, and accumulation limits heavily influence these factors

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Decision Points Affecting the Ability to form and Maintain Voluntary "Risk Pools"

1. Fleet consolidation may assist the formation of risk pools
   - Fewer participants will increase the likelihood of agreements forming (means relatively high accumulation limits)
2. Initial allocation of constraining, risk species may influence the formation of risk pools
   - Greater balance across harvesters helps foster the development and maintenance of risk pools
3. Accumulation limits for constraining, risk species
   - Restricts the amount of species any one entity can control
4. Presence of a grandfather clause for constraining, risk species
   - Also impacts the amount of species any one entity can control

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A-2.1.1.a – Groups Eligible for An Initial Allocation

(Overview for the -- GAC 5/13/08)

- •Impact of Initial Distribution on Long Term Distribution (pg A-14 - A-70)
- •Impact on Conservation (pg A-70 – A-73)
- •Impact on Sector Health (pg A-73 – A-90)
- •Impact on Net Benefits (pg A-90 – A-93)
- •Impact on Equity (pg A-93 – A-100)

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Main Focus Today: Impact of Initial Distribution on Long Term Distribution (I)

Basic Concepts

- –Raw Fish Markets (page A-22)
  - •(Resource Rents and Fully Competition and Market Power Situations)
- –QS(QP) Market Interaction With Raw Fish Market (page A-25)
  - •What Happens in the Market When IFQs are Introduced

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Main Focus Today: Impact of Initial Distribution on Long Term Distribution (II)

- •Influences on QS Flow Among Groups
  (Figure 6, pg A-30, start at center of diagram)
  - –Relative Efficiency (Page A-31)
  - –Vertical Integration (Page A-33)
  - –Market Power (Page A-37)
  - –Access to Capital (Page A-53)
- •Each section on influences addresses
  - –Status quo conditions of the factors of influence
  - –Effect of IFQs, Independent of the Initial Allocation
  - –Effect of the Initial Allocation
- •Summary of all in Table 2, page 21

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- •Raw Fish Markets
  - –Market Equilibrium
  - –Quota Constraints
  - –Resource Rents and Dissipation
  - –Fully Competitive Sectors
  - –Exertion of Market Power

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- QP Market and Interaction With Raw Fish Markets
  - – QS/QP and Capture of Resource Rents
    - Fully Competitive Situation
    - Market Power
      - – Allows an entity to capture more profits if
        - » Market power is used for catch for which the entity does not hold QP
        - » There is overcapitalization or other short term disequilibrium among trading partners
          (in which case profits related for return on capital could be at risk)

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- Influences of Flow Among Groups

(Figure 6, Page A-30)

  - Relative Efficiency (Page A-31)
    - Within Sectors
    - Across Sectors and Alternative Business Models
  - Vertical Integration (Page A-33)
    - Protect supply, protect returns on investment, rent capture, foreclosure (accumulation limits affect)
  - Market Power (Page A-37)
    - Porter Model (Page A-38)
      - Rivalry, Substitutes, Bargaining Power, Barriers to Entry (Competitive Strategy, Techniques for Analyzing Industries and Competitions, Porter, 1980)
  - Access to Capital (Page A-53)

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- Access to Capital (continued)
  - Demand
    - Willingness to Pay
    - Risk Preferences
  - Planning Time Horizons
  - Supply
    - Risk factors: size, diversity, equity of value in other industries, business plan

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Summary of Influences on Distribution of QS Over Time (pages A-59 – A-70)

- Summary Table on Each Influence
  - The gray text in each table repeats information from previous tables on
    - Status Quo
    - Effects of IFQ Program
      - (without regard to initial allocation)
  - New text summarizes the effect of the initial allocation

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A-2.1.1.a – Groups Eligible for An Initial Allocation

•Recap of the Sections

(we covered only the first today)

–Impact of Initial Distribution on Long Term Distribution (pg A-14 - A-70)

•starts with an executive summary and section overview,

•ends with a more detailed summary

–Impact on Conservation (pg A-70 – A-73)

–Impact on Sector Health (pg A-73 - A-90)

–Impact on Net Benefits (pg A-90 - A-93)

–Impact on Equity (pg A-93 - A-100)

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Biological Effects of Trawl Rationalization

- Increases in amount of catch of certain species
- Increased catch accounting
- Ecosystem level effects
- Changes to habitat

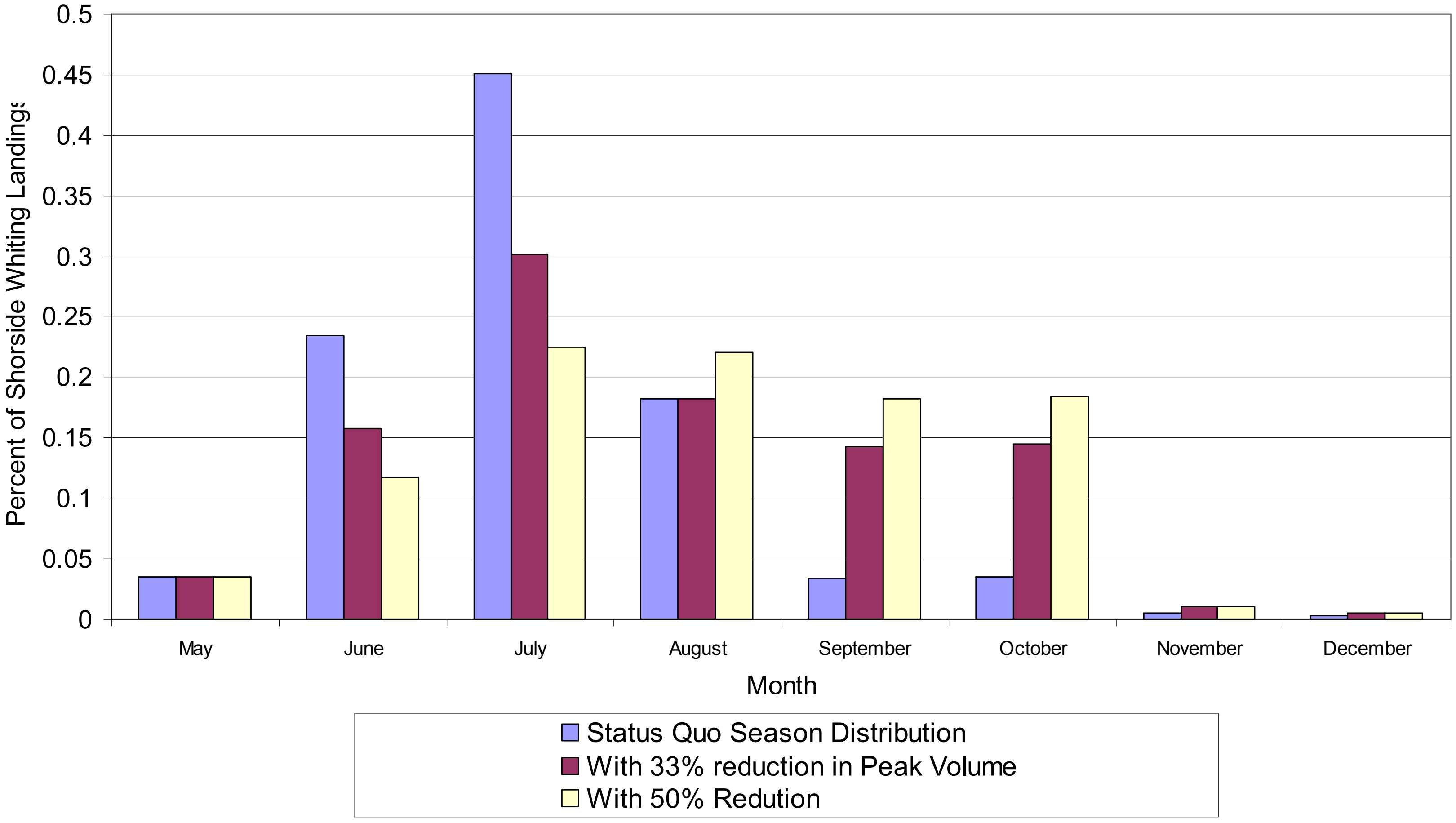
Analysis Shows Several Expected Effects of Rationalization

- Fleet consolidation in shoreside whiting, mothership whiting, and non-whiting sector
- Change in season length in SS and MS whiting
- Potential for increased harvest of non-whiting groundfish
- Consolidation of processing capital in shoreside whiting and mothership whiting fishery
- Potential for changes in negotiation power between harvesters and processors
- Potential for geographic shifts in fishery and delivery patterns in non-whiting sector
- Risks to quota holders from coverage of low OY or low allocation species with IFQ

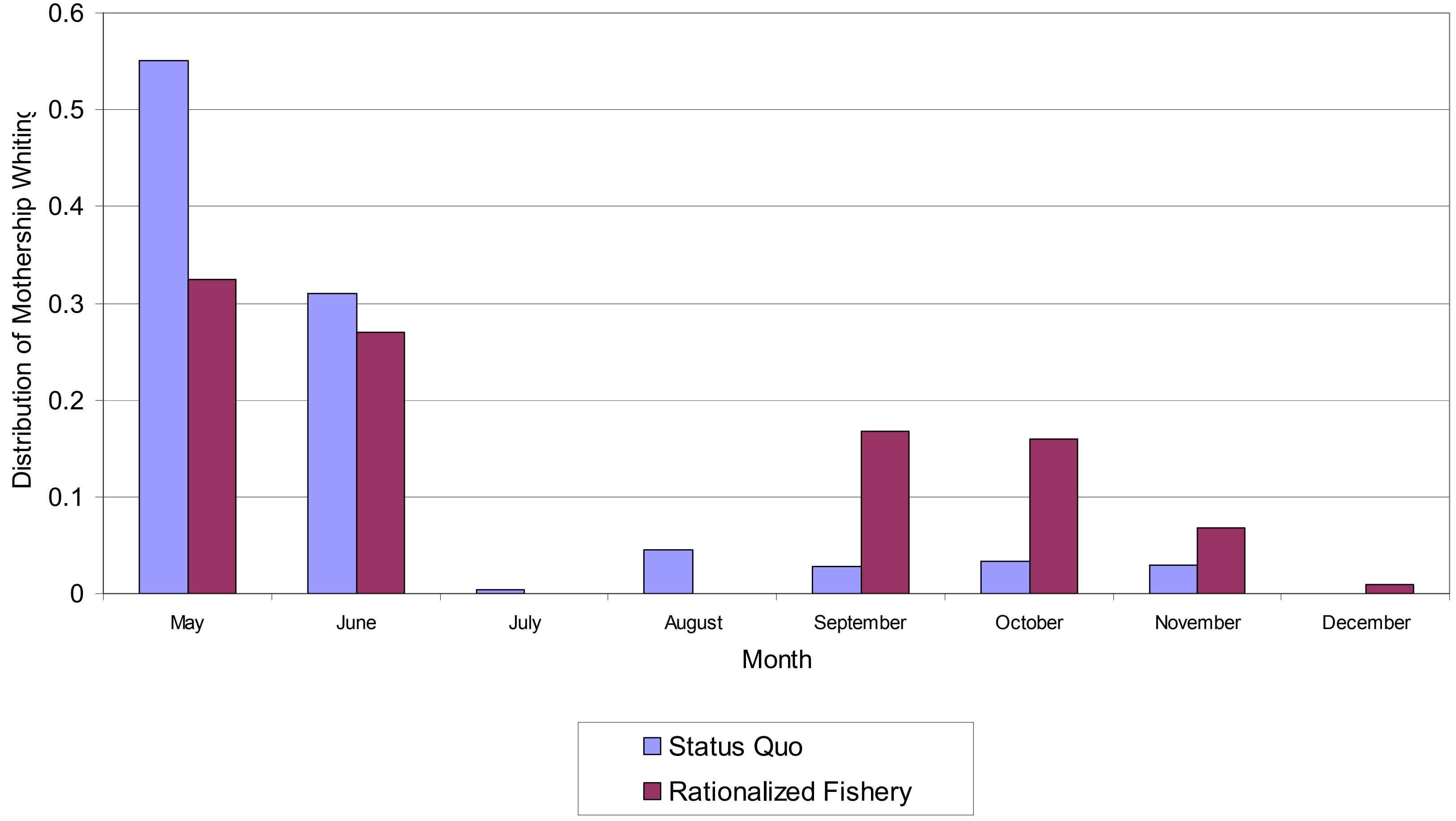
Fleet Consolidation

- Non-whiting: from 100-120 to 40-60 vessels
  - Expected to decrease harvesting costs by several million dollars.
- Shoreside whiting: from 37 – 23 vessels
- Mothership whiting: from 20 – 14 vessels

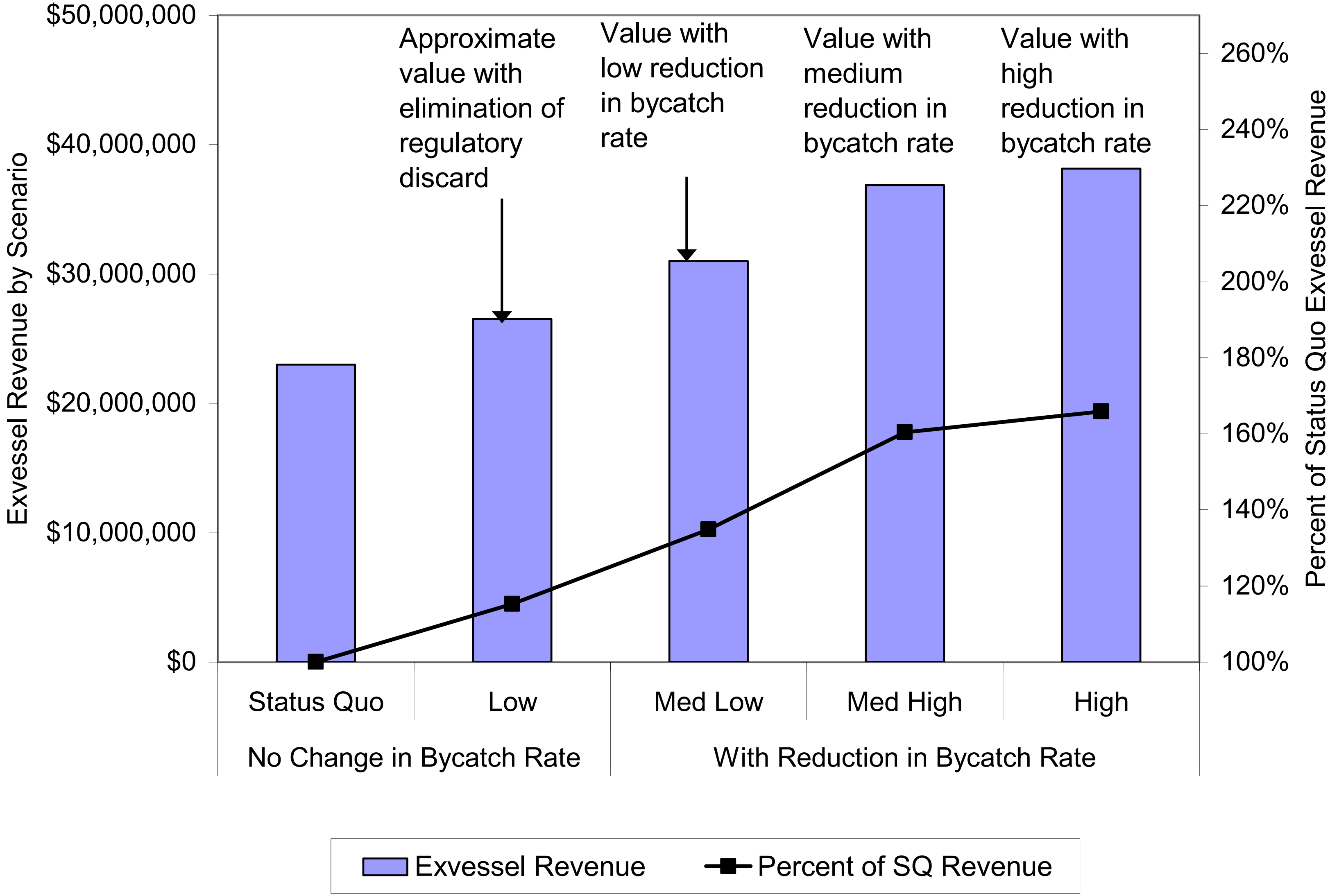
Timing and Distribution of SS Whiting Fishery



Timing and Distribution of MS Whiting Fishery



Increased Harvest and Gross Revenue in Non-Whiting



Processor Consolidation

- Shoreside whiting: need for processing capital may decline by 30 – 50%
- Mothership whiting: need for processing capital may decline by 40%
- Non-whiting: utilization of processing capital may increase by 12 – 35%

Exvessel Prices

- Appears exvessel prices in shoreside whiting sector have the potential to change more than in other sectors
  - Switch from a “race for fish” to rationalization
  - Little vertical integration relative to other sectors
- Exvessel prices may change in non-whiting to some degree, though not to the same degree as shoreside whiting
  - Not moving from a “race for fish” condition
- May be cases where prices in mothership sector change.
  - Vertical integration and BSAI pollock relationships may temper this effect.

Geographic shifts in fishing and delivery location

Port	Fleet Efficiency Score	Bycatch Dependent Area Score	Shorebased Infrastructure	Initial Allocation of Grndfish	Score
BELLINGHAM	?	– –	+ +	+	
NEAH BAY	–	– –	– –	–	–
WESTPORT	–	+	+	–	
ASTORIA	+	+	+ +	+ +	+
NEWPORT	+	–	+ +	+	
CHARLESTON (COOS BAY)	+	+	+ +	+	+
BROOKINGS	+	+	–	+	
CRESCENT CITY	–	+	+	–	
EUREKA	+	+	+	+	+
FORT BRAGG	–	+	+	+	
SAN FRANCISCO	–	–	+ +	+	
MOSS LANDING	–	– –	+	+	
PRINCETON/HALF MOON BAY	–	– –	+	+	
MORRO BAY	?	+	–	–	

Risks from Low OY or Low Allocation Species

- May constrain harvest activity and place a large burden on individuals if such species are encountered
- Many of these stocks do not have a conservation concern
  - Nearshore groundfish
  - Flatfish in whiting sectors

Share of Trawl Landings North and South of 40-10

	1994-2003		
	All Permits	**Non-buyback**	**2004-2006**
Sablefish			
North of 40-10	82.34%	80.78%	86.96%
South of 40-10	17.66%	19.22%	13.04%
Shortspine Thornyheads			
North of 40-10	72.77%	68.26%	71.39%
South of 40-10	27.23%	31.74%	28.61%
Longspine Thornyheads			
North of 40-10	75.39%	71.10%	54.37%
South of 40-10	24.61%	28.90%	45.63%
Dover Sole			
North of 40-10	71.73%	66.82%	81.92%
South of 40-10	28.27%	33.18%	18.08%
Petrale Sole			
North of 40-10	81.99%	77.26%	86.08%
South of 40-10	18.01%	22.74%	13.92%
Other Flatfish			
North of 40-10	56.25%	44.66%	77.02%
South of 40-10	43.75%	55.34%	22.98%

SUPPLEMENTAL ANALYSIS

This supplement provides information in response to actions taken at the May Groundfish Allocation Committee (GAC) and Trawl Individual Quota Committee (TIQC) Meetings:

A-1.2 Scope for IFQ Management **Page 4**

Species to be covered by the Primary Catch Control Tool (i.e. Individual Fishing Quotas [IFQs] or co-ops)

> The TIQC reviewed data on levels of catch for a variety of species in the groundfish fishery and on that basis recommended that certain rarely taken species not be managed with IFQs nor with co-ops. Their recommendations and the data they reviewed is provided.

A-1.2 IFQ Management Units **Page 8**

Area Subdivision

> The GAC asked the Groundfish Management Team (GMT) and TIQC to consider subdivisions of the IFQ by area. The current option would create a subdivision at 40^{o}10' N latitude. If this becomes a preferred alternative, additional analysis will be required in order for the Council to take final action on this provision in November. One of the first steps required is a determination of the proportion of the quota share (QS) that would be allocated north and south of the line. Excerpts from previous GMT reports are provided, including an example of an approach that would base the north-south allocation on fleet catch history in each area for 1994-2003. The entire June 2007 GMT report is appended to the end of this document (page 27).

A-2.1.1.d Allocation Formula, Permits with Catcher Vessel History **Page 9**

Equal Allocation of History Associated with Buyback Permits **Page 9**

> The GAC has recommended equal sharing of the catch history associated with buyback permits among permits eligible for QS allocations. Figures are provided which illustrate the effect of allocation to permits with and without the equal sharing component compared with their average shares of groundfish catch during 2004-2006.

Bycatch Rates for Use in Allocating Overfished Species **Page 10**

> Under Overfished Species Option 2, nonwhiting QS would be allocated based on the target species QS a permit received, fleet average bycatch rates, and permit specific logbook records. The current methodology would stratify bycatch rates by depth (inside and outside the RCA) and latitude (north and south of 40^{o}10'). The GAC requested consideration of finer degrees of north-south stratification. Two options are illustrated.

A-2.2.1 Permit/IFQ Holding Requirement **Page 15**

Fishing Prohibitions and Groundfish Catch in Nongroundfish Fisheries.

> The IFQ alternatives specifies that if a vessel is over its Quota Pounds (QP) limit it may not fish in fisheries within the scope of the program. Additionally, at its November 2007 meeting, the Council added an option:
>
> > **Option:** There may be exceptions and additions to the activities which will be prohibited when a vessel has an overage (see footnote)
> >
> > > Footnote/
> > > Within the scope of the IFQ program.
> > >
> > > > An, overage **will not** prevent a vessel from using the following gears to target on nongroundfish species, even if there is some incidental groundfish catch:
> > > > Salmon troll; HMS troll gear and other legal surface hook-gear that also qualify as vertical hook-and-line or dinglebar under the groundfish FMP.
> > >
> > > Outside the scope of the IFQ program.
> > >
> > > > An, overage **will not** prevent a vessel from fishing using:
> > > >
> > > > > Dungeness crab gear
> > > > > all, other HMS gears (including pelagic longline) except small mesh gillnet
> > > > > or purse seine gear for coastal pelagic species
> > > >
> > > > An overage **will** prevent a vessel from using: small mesh gillnet for highly migratory species.
> > > >
> > > > Provisions based on Amendment #6 to Motion 20 at the November, 2007 Council meeting.

At that time the Council also requested some analysis of amounts of bycatch in some of the non-groundfish fisheries. Some of the requested information is provided here.

A-2.2.3.e Accumulation Limits **Page 16**

Changes in Permit Ownership

> The TIQC has recommended that consideration be given to establishing control accumulation limits (percentages of total QS) based on the maximum QS that would be allocated to entities calculated on their permit holdings as of January 1, 2004 or January 1, 2008 (whiting). As a first step in developing an analysis of these options, we need to determine ownership differences compared with the current data set (which was constructed in the fall of 2006). A table is provided indicating permits that may have changed hands over the period. These were identified based on differences in registered names and addresses. However, there are circumstances where both names and addresses can change without an actual change in ownership. We are therefore seeking comment on whether the list provided actually reflects real changes in ownership.

A-4 Halibut Individual Bycatch Quota (IBQ) **Page 19**

Development of the Halibut IBQ Option.

Halibut IBQ would essentially function in the same way and according to the same rules as the IFQ for other species, except that retention of the halibut would be prohibited. Some of the main issues to be addressed are: how the amount of bycatch allocated to the trawl fishery would be determined; how halibut bycatch might be reduced over time; and whether only legal sized halibut or both legal and sub-legals would count against the halibut IBQ. The TIQC posed a number of questions to be addressed in order to move forward with an option for halibut IBQ. These questions and the responses are provided.

B-2.2.1.a Catcher Vessel Mothership Whiting Endorsement Qualification and History Assignment **Page 23**

The GAC recommended adding the 1994-2003 time period as an option for allocating catch among permits qualifying for participation in the mothership co-op fishery. The options would then be:

Option 1: best 6 out of 7 years from 1997 through 2003
Option 2: best 8 out of 10 years from 1994 through 2003

The option for allocating IFQ for shoreside whiting is best 8 out of 10 years from 1994-2003. The new coop option, matching the option for IFQs, was added partially out of concern that if the shoreside and mothership options do not match, a vessel that fished in the shoreside fishery in the early years of the allocation period and in the mothership fishery in the later years of the allocation period might receive a near full allocation for both fisheries and, in a sense, would be "double dipping." Some data tables are provided to illustrate this issue.

Previously, the IFQ alternative specified that a permit must drop the same two years in the allocation formula for the shoreside and mothership QS allocation formulas. A similar provision was in place for the co-op alternative. If the GAC recommendation is followed and IFQs are used for the shoreside whiting fishery and co-ops for the at-sea mothership fishery, and if the same time period is used for both fisheries (1994-2003), is it still the Council's intent that the same two years must be dropped? If so, a complexity is created in that relative pounds are used in the IFQ allocation formula (pounds are counted as a percent of the fleet's total catch for each year) but absolute pounds are used in the co-op allocation formula. Absent direction otherwise, analysts will develop a methodology that drops the lowest two years of each permits' catch history such that the permit receives the maximum combined allocation of shoreside QS and mothership coop quota for which it could possibly qualify under the existing options.

A-1.2 Scope for IFQ Management

Species to be Covered by the Primary Catch Control Tool

Catch data provided to the TIQC in May 2008

Table 1. from NMFS report on Total Mortality Report from WCGOP – Estimated total mortality (mt) of major west coast groundfish species during 2005, by sector.
Table 2. from NMFS Report on Total Mortality Report from WCGOP – Estimated total mortality (mt) of major west coast groundfish species in 2006, by sector.
Table 3. Catch of Groundfish in Non-tribal At-sea Fisheries by Year and Species.

<u>Excerpts from the TIQC Report from May 2008:</u>
Species recommended for trigger mechanism management in the shoreside fishery are listed in the table below:

SHORESIDE FISHERY NON-COVERAGE	
Longspine S 34°27'	California Scorpionfish
Minor Nearshore Rockfish N	Cabezon
Minor Nearshore Rockfish S	Kelp Greenling
Black Rockfish (WA)	Shortbelly
Black Rockfish (OR-CA)	Other Rockfish

At-Sea: The TIQC recommended two options for Council consideration: 1) status quo or 2) a trigger mechanism for certain species. The suggested management action at the trigger point could be a bycatch cap that is distributed to the co-ops. At-sea sector species that are recommended for either the trigger mechanism or status quo management are listed in the table below:

AT-SEA FISHERY COVERAGE	
STATUS QUO (and existing co-op alternative)	PROPOSAL FOR COVERAGE
WIDOW	SLOPE ROCK
DARKBLOTCHED	SHELF ROCK
CANARY	CANARY
	DARKBLOTCHED
	LINGCOD
	POP
	SABLEFISH
	WIDOW
	YELLOWTAIL

Table 1. Estimated total mortality (mt) of major west coast groundfish species during 2005, by sector.

	Shoreside commercial fisheries				All at-sea hake fisheries	Shore-side WA Tribal	Total recreational fishing mortality			Research	Remaining GMT Scorecard [3] Values	Estimated total fishing mortality
	Estimated non-hake trawl [1]	Estimated hake trawl	Estimated non-trawl [2]	Total shoreside mortality			CA	OR	WA			
Target species												
Sablefish	2,553	22	3,242	5,817	15	700	0	1	0	10		6,543
Shortspine thornyhead	627	0	147	774	7	11	0	0	0	4		796
Longspine thornyhead	723	0	17	740	0	0	0	0	0	10		750
Dover sole	7,327	0	6	7,333	0	145	0	0	0	28		7,507
Petrale sole	2,732	0	0	2,733	0	30	0	0	0	4		2,766
English sole	1,151	0	0	1,151	0	66	0	0	0	4		1,222
Arrowtooth flounder	3,450	1	87	3,539	4	158	0	0	0	5		3,706
Other Flatfish	1,872	0	2	1,874	3	47	25	0	2	13		1,965
Blackgill rockfish [4]	53	0	36	89	0	0	0	0	0	0		90
Splitnose rockfish [4]	230	0	1	231	0	0	0	0	0	7		237
Other slope rockfish	171	4	87	262	51	28	0	0	0	4		345
Yellowtail rockfish [5]	56	173	10	239	112	539	9	13	20	3		935
Chilipepper rockfish [6]	76	0	3	79	0	0	4	0	0	14		97
Other shelf rockfish	98	27	52	176	6	10	281	6	1	19		501
Black rockfish	1	0	174	175	0	0	180	311	271	0		937
Other nearshore rockfish	1	0	99	100	0	0	441	41	7	0		590
Cabezon	0	0	62	62	0	0	47	17	7	0		133
Kelp greenling	0	0	23	23	0	0	5	4	2	0		35
Pacific hake/whiting	826	97,574	0	98,400	151,003	11,767	0	0	0	42		261,212
Pacific cod	726	1	5	732	0	124	0	0	8	0		864
Spiny dogfish	1,194	96	383	1,672	355	6	3	0	0	9		2,044
Longnose+big+Unsp. skate	1,745	1	141	1,887	1	23	0	0	0	8		1,920
Other groundfish	1,633	188	160	1,981	417	20	0	0	0	8		2,425
Dungeness crab	254	0	1	255	0							255
Tanner crab	252	0	9	261	0							261
Rebuilding species (as of 2005)												
Lingcod	266.3	5.9	91.2	363.4	3.4	29.9	299.3	131.7	58.6	4.0	0.0	890.4
Canary rockfish	26.0	2.2	1.9	30.1	1.4	4.3	2.0	4.9	1.9	2.3	1.8	48.7
Widow rockfish	6.3	76.8	2.1	85.2	80.0	28.6	1.6	1.6		1.6	0.4	198.9
Yelloweye rockfish	0.8	0.0	2.9	3.8	0.0	0.8	0.9	4.1	5.2	0.6	0.3	15.7
Bocaccio [6]	29.3	0.0	4.5	33.8	0.0	0.0	38.1	0.0	0.1	1.7	1.3	75.1
Cowcod [6]	1.4	0.0	0.0	1.5	0.0	0.0	0.4	0.0	0.0	0.1	0.0	2.0
Pacific ocean perch [7]	67.7	0.5	1.0	69.2	1.7	3.5	0.0	0.0	0.0	1.8	0.0	76.2
Darkblotched rockfish	100.4	5.5	4.8	110.6	11.1	0.1	0.0	0.0	0.0	2.1	0.0	123.9

[1] Includes minor landings by trawlers not targeting groundfish [2] Includes minor landings made with troll gear

[3] The Pacific Fishery Management Council's Groundfish Management Team Bycatch Scorecard (Table 17) contains estimates of mortality for species that are managed under rebuilding plans.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[5] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[6] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category. [7] Amounts in this row are for the area north of 40°10' N. Lat.

Table 2. –Estimated total mortality (mt) of major west coast groundfish species during 2006, by sector.

	Shoreside commercial fisheries				All at-sea hake fisheries	Shore-side WA Tribal	Total recreational fishing mortality			Research	Remaining GMT Scorecard [3] Values	Estimated total fishing mortality
	Estimated non-hake trawl [1]	Estimated hake trawl	Estimated non-trawl [2]	Total shoreside mortality			CA	OR	WA			
Non-rebuilding species												
Sablefish mortality	2,654	11.0	3,119	5,785	2	669	0.0	2.1	0	11		6,470
Shortspine thornyhead	649	0.1	178	827	0.5	21	0.0	0	0	4		853
Longspine thornyhead	821	0	21	843	0.0		0	0	0	11.6		854
Dover sole	7,476	0.0	5	7,480	0.0	221	0	0.0	0	28.8		7,730
Petrale sole	2,690	0.0	4	2,694	0	26	0.5	0.0	0	2.3		2,723
English sole	1,291	0.0	0.0	1,291	0.0	42	0.0	0.0	0	2.5		1,336
Arrowtooth flounder	2,818	2.3	79	2,899	2.8	197	0	0.0	0	6.1		3,105
Other Flatfish	1,855	0.1	4	1,859	0.3	60	27.6	3.3	0.2	11.8		1,962
Blackgill rockfish [3]	66	na	57	123	na	na	0	na	na	0.4		123
Splitnose rockfish [3]	159	na	0	160	na	na	0	na	na	2.1		162
Other slope rockfish N	187	2.8	58	248	8.2	25	0	0.0	0	2.5		283
Other slope rockfish S	122	na	10	132	na	na	0.0	na	na	1.3		133
Yellowtail rockfish [4]	32	153.7	3	189	109	172	0.4	8.7	13.9	1.2		493
Chilipepper rockfish [5]	116	na	0	116	na	na	1.6	na	na	8.3		126
Other shelf rockfish N	46	9.2	18	73	4	10	5.8	6.3	0.6	4.6		104
Other shelf rockfish S	22	na	35	57	na	na	275	na	na	3.1		334
Black rockfish	5	0	156	161		0.0	186	281	268	0		896
Other nearshore rockfish N	3	0.1	34	37	0.0	1.1	18.3	31.5	7.9	0.0		96
Other nearshore rockfish S	0	na	61	61	na	na	649	na	na	0.0		711
Lingcod mortality	272	5.4	100	378	3.2	45	348	127	47	5.3		952
Cabezon	0	0	51	51	0	0	31.6	18.7	4.3	0		106
Kelp greenling	0	0	17	17	0	0	8.2	21.7	1.6	0.0		48
Pacific hake	942	97,078	0	98,021	139,774	29,896	0.1	0.1	0	16.0		267,707
Pacific cod	344	0.9	0.5	346	0.1	36	0	0.0	3.5	0.2		385
Spiny dogfish	666	33.2	563	1,262	59	77	3.9	0.0	0	5.8		1,407
Longnose+big+Unsp. skate	780	1.7	198	980	0.8	39	1.1	0	1.6	7.3		1,029
Other groundfish	842	1.7	78	922	1.0	0.9	88.6	0.0	0.2	2.6		1,015
Rebuilding species												
Canary rockfish	23.7	1.6	2.9	28.2	1.1	2.9	12.3	2.9	1.1	7.2	1.3	57.0
Widow rockfish	6.5	47.9	0.8	55.2	143.3	9.9	3.3	1.1	0	0.2	0.9	213.8
Yelloweye rockfish	1.4	0.1	1.5	2.9	0.0	0.5	4.1	2.5	1.7	0.1	0.4	12.2
Bocaccio [5]	18.8	na	0.0	18.8	na	na	42.0	na	na	0.2	0.3	61.3
Cowcod [5]	0.9	na	0	0.9	na	na	0.2	na	na	0.0	0.0	1.1
Pacific ocean perch [6]	71.7	0.1	0.3	72.1	3.1	3.9	0	0	0	1.2	0.0	80.3
Darkblotched rockfish	178.5	2.1	0.5	181.1	11.1	0.1	0	0	0	0.9	0.0	193.3

[1] Includes minor landings by trawlers not targeting groundfish [2] Includes minor landings made with troll gear [3] The Pacific Fishery Management Council's Groundfish Management Team Bycatch Scorecard (Table 17) contains estimates of mortality from non-groundfish fisheries for species that are managed under rebuilding plans.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[5] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[6] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[7] Amounts in this row are for the area north of 40°10' N. Lat.

Table 3.

Catch of Groundfish in Non-Tribal At-Sea Fisheries by Year and Species

	YEAR		
Species	2005	2006	2007
ARROWTOOTH FLOUNDER	1.3	1.1	2.5
AURORA ROCKFISH	0.0	0.0	0.0
BANK ROCKFISH	0.0	0.0	0.2
BIG SKATE	0.7	0.6	0.7
BLACK ROCKFISH	0.0	0.0	0.0
BLACKGILL ROCKFISH	0.0		0.0
BLUE ROCKFISH		0.0	
BOCACCIO	0.3	0.1	0.1
CANARY ROCKFISH	1.0	1.0	2.0
CHILIPEPPER	1.1	3.8	0.3
DARKBLOTCHED ROCKFISH	11.1	11.0	12.0
DOVER SOLE	0.4	0.0	0.1
ENGLISH SOLE	0.1	0.0	0.0
FLATHEAD SOLE	0.0	0.0	0.0
GREENSTRIPED ROCKFISH	0.0	0.0	0.0
HARLEQUIN ROCKFISH		0.0	
KELP GREENLING	0.0	0.0	
LINGCOD	2.4	3.1	5.2
LONGNOSE SKATE	0.6	0.1	0.6
LONGSPINE THORNYHEAD		0.0	
PACIFIC COD	0.0	0.0	0.0
PACIFIC HALIBUT	1.8	0.6	1.1
PACIFIC OCEAN PERCH	1.6	2.6	3.6
PETRALE SOLE			0.0
QUILLBACK ROCKFISH		0.0	
REDBANDED ROCKFISH	0.0		
REDSTRIPE ROCKFISH	4.5	0.2	1.1
REX SOLE	3.2	0.3	0.3
ROSETHORN ROCKFISH	0.0	0.0	0.0
ROUGHEYE ROCKFISH	35.9	6.6	28.9
SABLEFISH	15.1	2.5	3.1
SHARPCHIN ROCKFISH	0.0	0.0	0.8
SHORTBELLY ROCKFISH	2.7	11.4	0.0
SHORTRAKER ROCKFISH	0.3	0.4	0.3
SHORTSPINE THORNYHEAD	7.1	0.5	2.8
SILVERGREY ROCKFISH	0.1	0.0	0.1
SLENDER SOLE	0.0	0.0	0.0
SOUPFIN SHARK	0.4	0.9	0.5
SPINY DOGFISH	70.1	22.9	86.4
SPLITNOSE ROCKFISH	15.1	1.0	2.2
SPOTTED RATFISH	0.0	0.0	0.0
STRIPETAIL ROCKFISH	0.1	0.0	0.0
TIGER ROCKFISH		0.0	
WIDOW ROCKFISH	78.6	139.2	145.5
YELLOWEYE ROCKFISH		0.0	0.0
YELLOWFIN SOLE		0.0	
YELLOWMOUTH ROCKFISH		0.0	0.0
YELLOWTAIL ROCKFISH	72.9	63.1	68.5

A-1.2 IFQ Management Units

Area Subdivision

Excerpt from GMT Report on Amendment 20 from November 2007:

Currently, the Council uses latitudinal and depth-based spatial management measures, as well as gear restrictions, to achieve area management objectives. If implemented as currently specified, trawl IQs may result in catch being more concentrated in smaller areas than under status quo. The GMT reiterated its recommendation that IQ be allocated on a more refined spatial scale than is currently being considered. In doing so, the GMT noted that care should be taken to balance biological objectives with economic objectives.

Establishing an IQ system that **separates groundfish stocks north and south of 40° 10'** North Latitude (e.g., **based on average fleet catch history in each area during the 1994-2003 period**) **–** and allocates individual fishing quotas accordingly – would provide an appropriate balance between biological, economic, and administrative objectives until a more appropriate set of areas can be established.

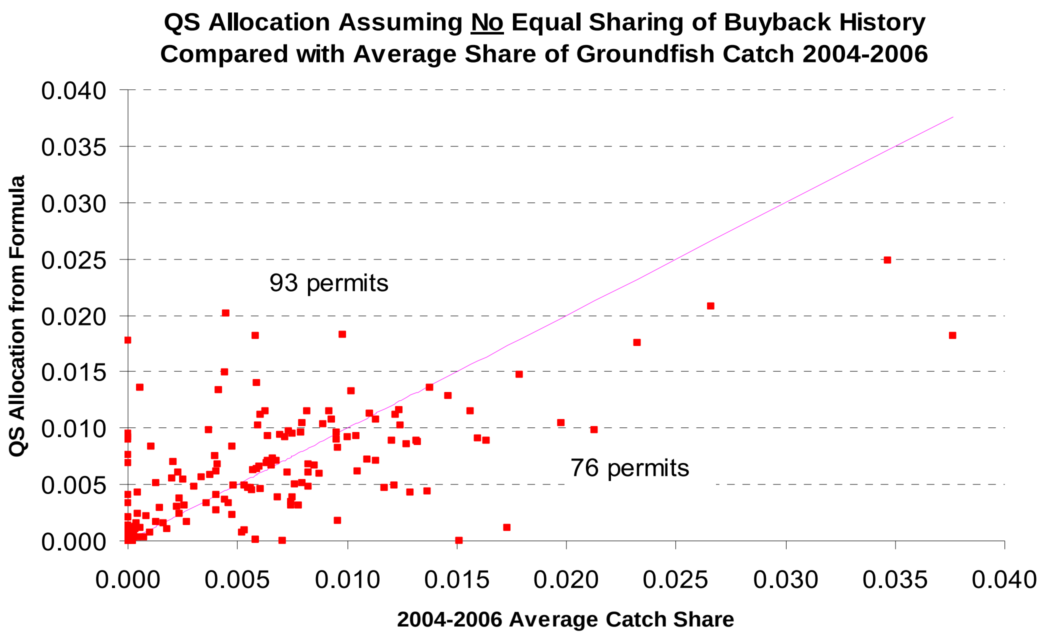
Excerpt from GMT Report on Amendment 20 from June 2007 (see page 27 for full report):

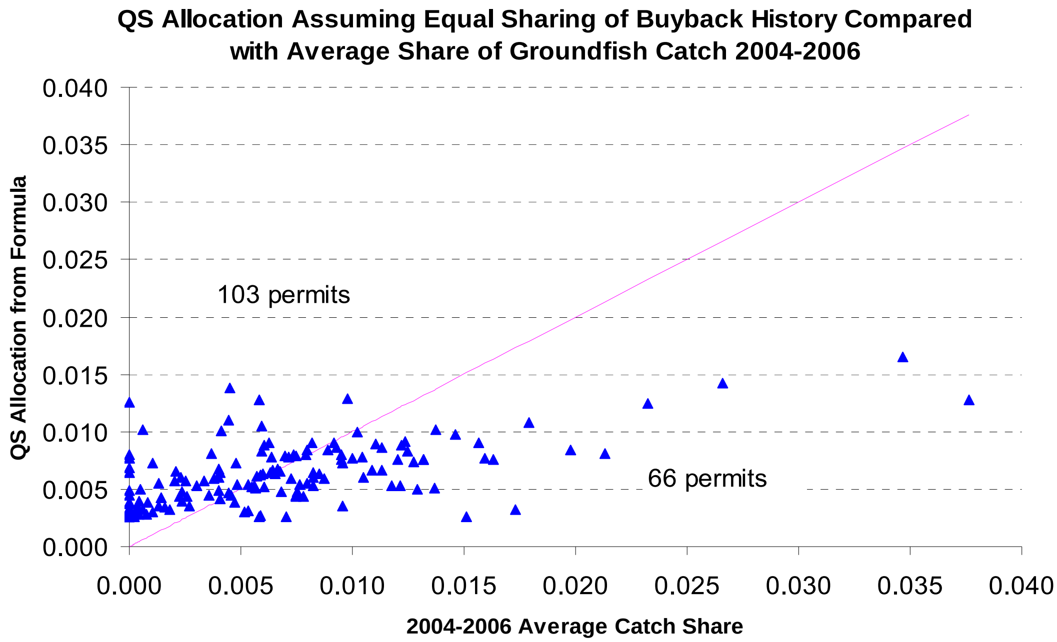
The GMT recommended that **the TIQ program incorporate area management tools currently in use** and continue to pursue data and research informing spatial management. Depending on the results of the data compilation and review, determine whether and how spatial management concepts could be used in developing fishery management measures for the 2009-2010 biennium as well as the development of an Ecosystem Fishery Management Plan.

A-2.1.1.d Allocation Formula, Permits with Catcher Vessel History

Equal Allocation of History Associated with Buyback Permits

The figure below illustrates expected shares of non-whiting harvest allocated to each permit as compared (vertical axis) to the 2004-2006 average share of nonwhiting harvest for each permit (horizontal axis). The top graph shows this comparison using a QS allocation formula based entirely on catch history and the bottom graph shows the comparison using a QS allocation formula that includes equal sharing of the catch history related to buyback permits. Permits along the diagonal line would be expected to receive an allocation comparable to their 2004-2006 catch. The graphs show that with an allocation formula based only on catch history 93 permits would receive more than their 2004-2006 average but with a formula that includes an equal allocation component 103 permits would receive more than their 2004-2006 average. At the same time, with an allocation formula based on catch history the maximum share of total QS revenue by any permit would be about 0.025 while with an equal allocation the maximum share would be about 0.016. Under equal allocation, the minimum share would be about 0.002.





Bycatch Rates for Use in Allocating Overfished Species

Area Stratification of Bycatch Rates for Use in Assigning Overfished Species Quota Shares based on a Bycatch Rate

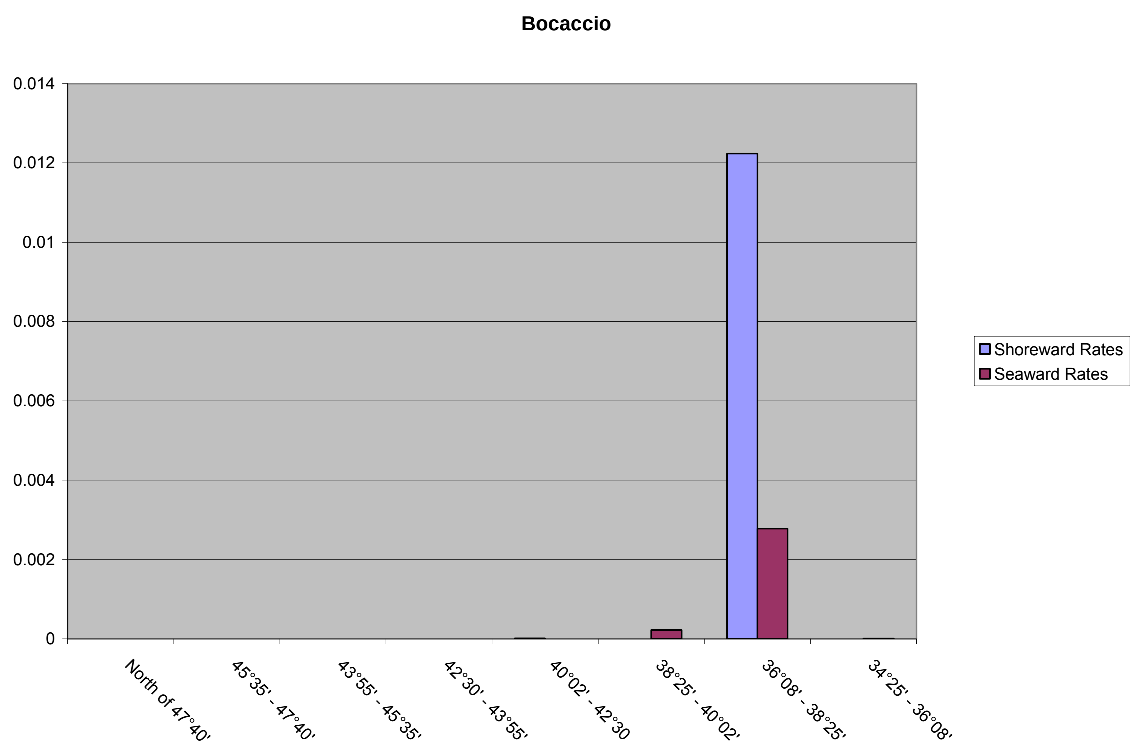
At the May meeting of the Groundfish Allocation Committee (GAC), the GAC requested that staff look into a more refined spatial scale of bycatch rates that could potentially be used for allocating overfished species based on a bycatch rate. Available data indicates that bycatch rates can differ substantially by latitudinal area and also by seaward or shoreward of the RCA. However, some limitations exist on refining data spatially because that data is a sample. In some cases, insufficient sample sizes exist for estimating a bycatch rate.

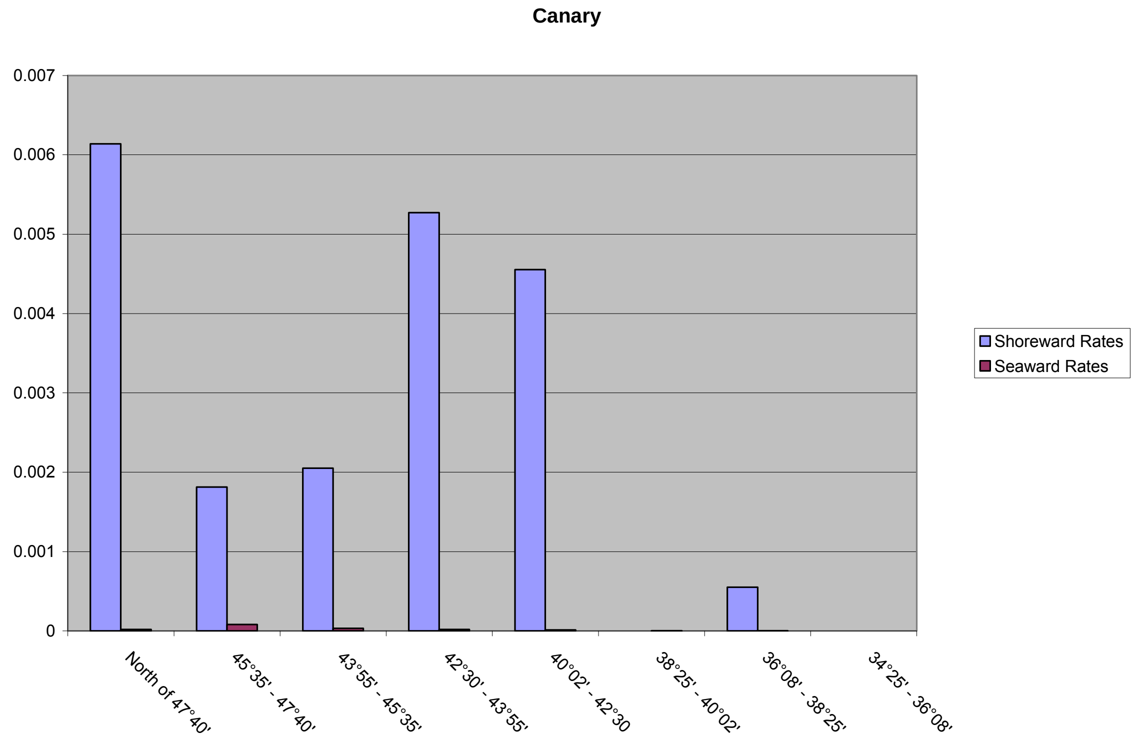
Based on patterns evident in available data and the limitation of available, staff developed the following proposals that illustrate areas to be considered for allocating based on a bycatch rate. These proposals would replace the existing proposal of allocating based on bycatch rates north and south of 40 10 if it is determined that allocating based on areas north and south of 40 10 is too broad and does not adequately capture variations in overfished species bycatch along the coast:

Existing Proposal:	North of 40 10 South of 40 10
Option 1:	North of 47 40 Between 47 40 and 43 55 Between 43 55 and 40 10 Between 38 and 40 10 South of 38
Option 2:	North of 47 40 Between 47 40 and 43 55 Between 43 55 and 40 10 South of 40 10

The difference between options 1 and 2 is the treatment of the area between 38 and 40 10. That area has a distinctly different bycatch of darkblotched rockfish, however the use of available data would result in no canary being allocated to vessels with catch history in that area. Therefore, option 2 results in more vessels receiving at least some overfished stocks, while option 1 results in a potentially more refined allocation of darkblotched based on recent fishing patterns. In both cases the entire area south of 38 is combined because several sub-areas do not appear to have sufficient observations for calculating an independent bycatch rate.

Figures illustrating the data used to develop the above options are shown in the figures below.

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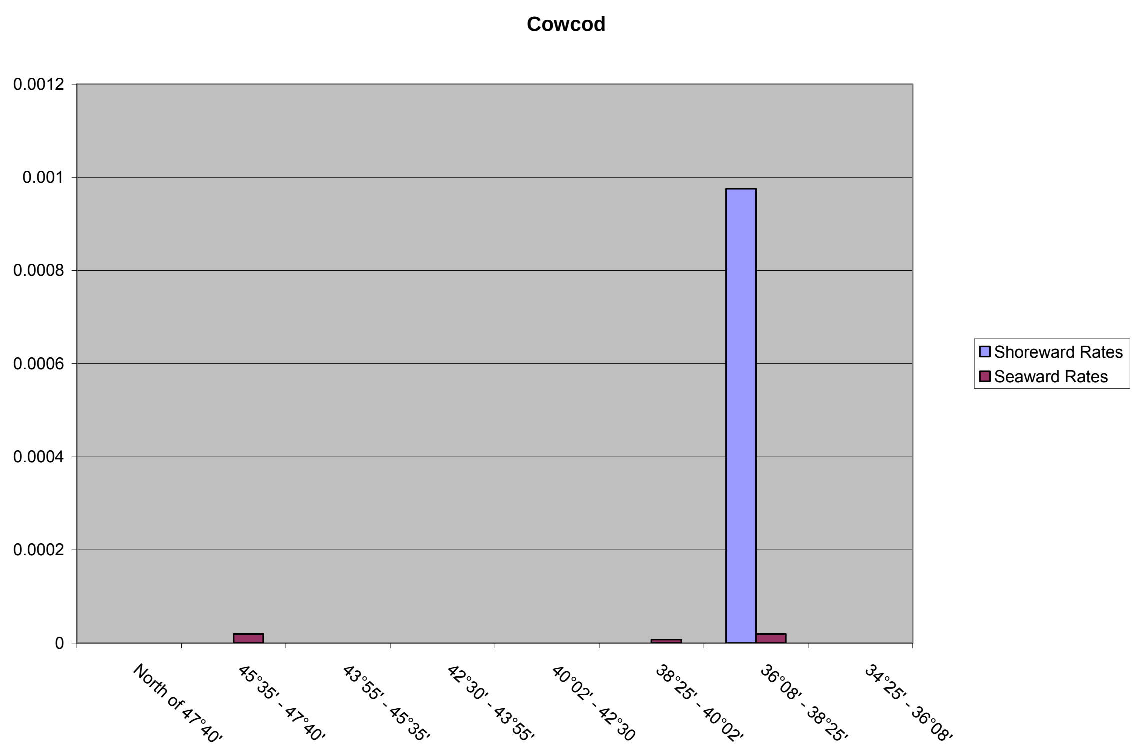
Shoreward Rates
Seaward Rates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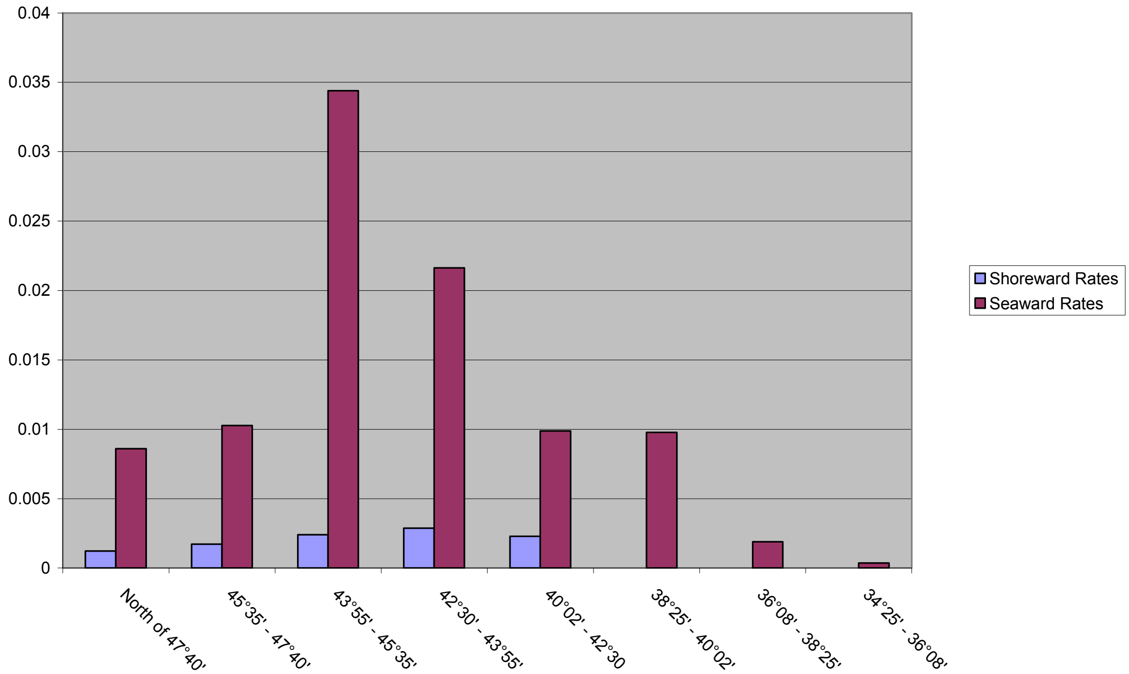
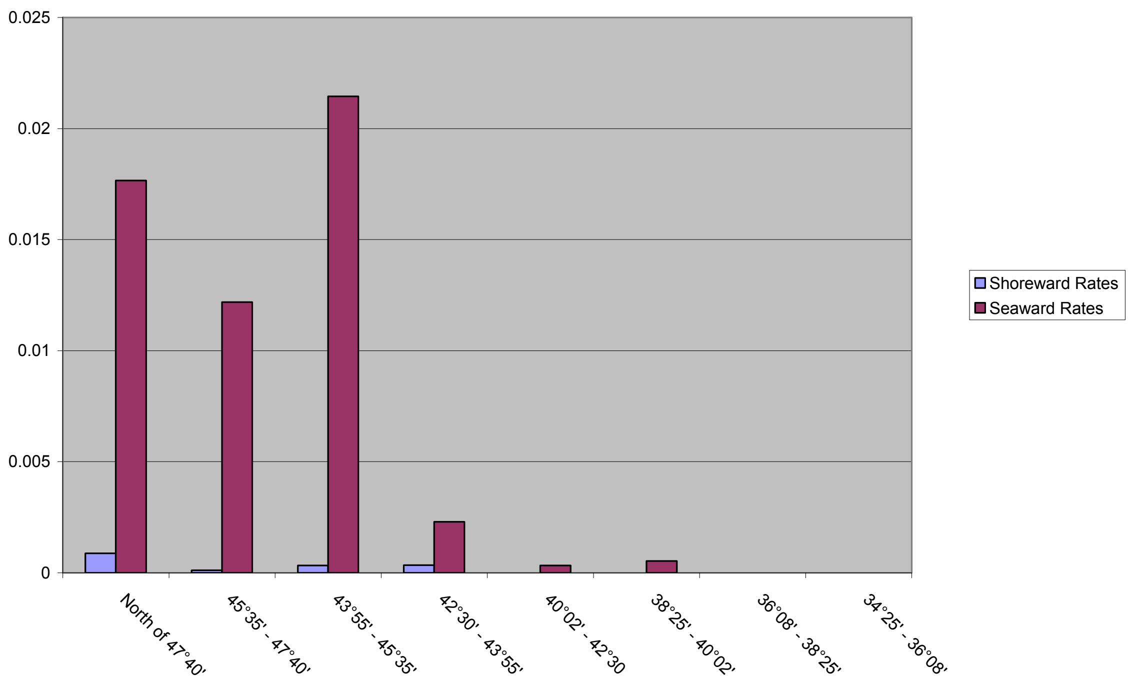
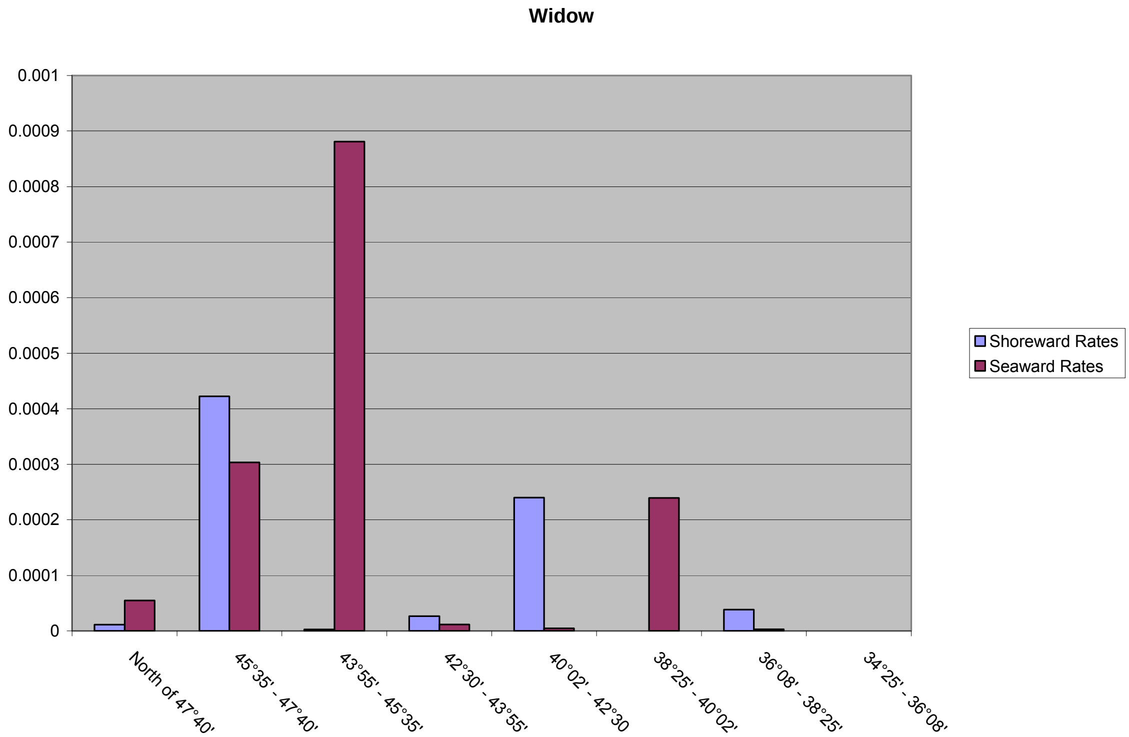
Shoreward Rates
Seaward Rates

Darkblotched



Pacific Ocean Perch

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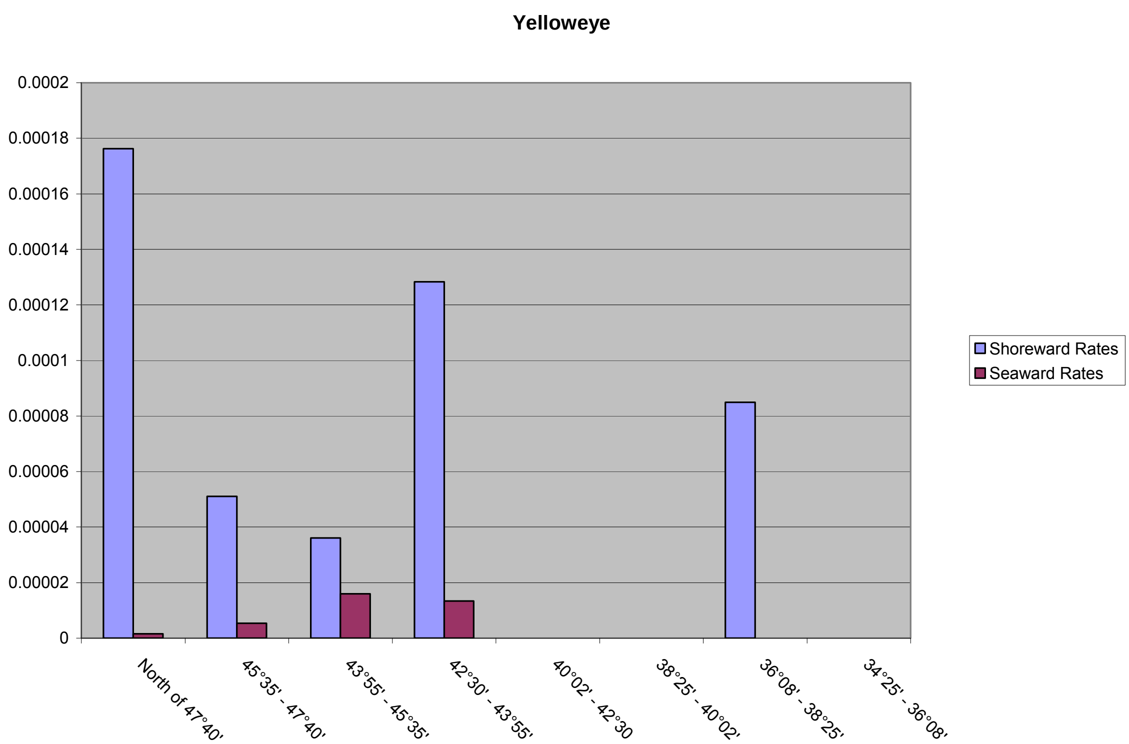
Shoreward Rates
Seaward Rates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45°35' - 47°40'
43°55' - 45°35'
42°30' - 43°55'
40°02' - 42°30
38°25' - 40°02'
36°08' - 38°25'
34°25' - 36°08'
Shoreward Rates
Seaward Rates

A-2.2.1 Permit/IFQ Holding Requirement

Fishing Prohibitions and Groundfish Catch in Nongroundfish Fisheries

Table 4. Groundfish catch in non-groundfish fisheries.

Year	lbs range	Pacific Halibut Longline	Ridgeback Prawn Trawl	Cal Halibut Hook and Line	Dungeness crab - Pot	Shrimp pot	Pink Shrimp Trawl	Salmon troll	Cal Halibut Trawl
		Number of boats							
2000	<100	29	19	69	32	9	18	253	21
	100-200	12	11	2	1	2	11	40	9
	>200	8	7	1	1		54	40	13
2001	<100	24	13	67	24	7	26	230	29
	100-200	10	11	4	1	5	15	34	16
	>200	10	10	1	1	1	42	19	18
2002	<100	34	11	58	21	4	21	191	27
	100-200	8	6	3	1	3	10	21	14
	>200	10	5		1	1	38	13	9
2003	<100	25	11	45	15	4	4	184	17
	100-200	13	8	1	1	3	1	24	3
	>200	14	6	2	2	2	3	12	3
2004	<100	17	4	44	5	3	2	209	11
	100-200	11	2	8	2	1	1	51	9
	>200	27	2	4	1	1	1	18	8

A-2.2.3.e Accumulation Limits

Changes in Permit Ownership

In order to evaluate the TIQC recommendation to establish control accumulation limits based on permit as of January 1, 2004 (shoreside) or January 1, 2008 (at-sea) we need to determine how that ownership varies from the ownership relationships identified in the current data set. The following are the permits for which we believe there may have been a change in ownership during this period (January 1, 2004 through January 1, 2008). Change was evaluated based on comparisons of names and addresses. This information is being published here and comment is requested on whether of any of the possible ownership changes we have identifies are not, in fact, ownership changes.

Table 5 – Permits and Ownership Change from January 1, 2004 to January 1, 2008

PERMIT	2004 Vessel	2004 Owner	Current Data Set (fall 2006)	2008 Vessel	2008 Owner
GF0026	CASSANDRA ANNE	CASSANDRA ANNE LLC	CASSANDRA ANNE LLC	CASSANDRA ANNE	OLYMPIC STAR LLC
GF0433	SEA CLIPPER	SEA PACIFIC INC	CALIFORNIA SHELLFISH COMPANY INC	SEA CLIPPER	SEA CLIPPER LLC
GF0008	UNIDENTIFIED	STANDARD FISHERIES CORP	THE NATURE CONSERVANCY	SOUTH BAY	THE NATURE CONSERVANCY
GF0068	UNIDENTIFIED	DILLER, WILLIAM G AND DILLER, JANA R	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0083	CYNTHIA	LARSEN, HARLEN K AND LARSEN, DARLENE R	LARSEN, HARLEN K AND LARSEN, DARLENE R	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0110	UNIDENTIFIED	TORACCA, GIOVANNI AND LEE, GORDON AND LEE, SHARON	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0453	UNIDENTIFIED	B & J FISHERIES INC	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0470	UNIDENTIFIED	KUBIAK, DONALD J AND KUBIAK, CHRISTOPHER J	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0589	UNIDENTIFIED	KUBIAK, DAVID ALLEN AND KUBIAK, DONALD J	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0031	FATE HUNTER	SEA SYSTEMS INC	LARKIN, MARION JEAN	UNIDENTIFIED	LARKIN, MARION JEAN
GF0136	OCEAN HUNTER	FLOTRE, MICHAEL G	LARKIN, MARION JEAN	OCEAN HUNTER	LARKIN, MARION JEAN
GF0675	NORDIC FURY	RAINIER INVESTMENTS INC	FURY GROUP INC	NORDIC FURY	FURY GROUP INC
GF0064	MARIE KATHLEEN	FREDERIC, GARY LOUIS	HODGES MICHAEL E AND JOHN MORELAND FISHING	MARIE KATHLEEN	HODGES MICHAEL E AND JOHN MORELAND

Table 5 – Permits and Ownership Change from January 1, 2004 to January 1, 2008

PERMIT	2004 Vessel	2004 Owner	Current Data Set (fall 2006)	2008 Vessel	2008 Owner
			INC		FISHING INC
GF0239	SOJOURN	F/V LIBRA INC	HODGES MICHAEL E AND JOHN MORELAND FISHING INC	SOJOURN	HODGES MICHAEL E AND JOHN MORELAND FISHING INC
GF0111	TRAVELER	F/V LESLIE LEE INC AND HALL DAN AND HOCKEMA REX	TRAVELER FISHERIES LLC	TRAVELER	TRAVELER FISHERIES LLC
GF0143	TWO SAINTS	ASTUY JR, PETER R	RIPKA, GARY A AND RIPKA, SHERRI	TWO SAINTS	RIPKA, GARY A AND RIPKA, SHERRI
GF0280	WESTERN BREEZE	ST CLAIR, JUNE M	RIPKA, GARY A AND RIPKA, SHERRI	WESTERN BREEZE	RIPKA, GARY A AND RIPKA, SHERRI
GF0947	UNIDENTIFIED	KUNTZ, LEO AND KUNTZ, KAREN	F/V LESLIE LEE INC	UNIDENTIFIED	F/V LESLIE LEE INC
GF0639	UNIDENTIFIED	CRAMER, LEO J AND CRAMER, JUNE I	WEST COAST FISHERY INVESTMENTS LLC	UNIDENTIFIED	WEST COAST FISHERY INVESTMENTS LLC
GF0971	STARWARD	FISH PRODUCTS INC	PEESHBAD LLC	STARBOUND	WEST COAST FISHERY INVESTMENTS LLC
GF0222	UNIDENTIFIED	HAMANN, FREDERICK L	JOHNSON, CARROLL R	ANDIAMO	JOHNSON, CARROLL R
GF0705	STORMBRINGER	JOHNSON, JAMES W	JOHNSON, CARROLL R	STORMBRINGER	JOHNSON, CARROLL R
GF0268	MISTASEA	RODGERS, BLAINE B	SMITH, RANDY JAY	MISTASEA	SMITH, RANDY JAY
GF0272	CALAMARI	HOGEVOLL, BENSON AND HOGEVOLL, RODNEY	F/V CALAMARI INC	CALAMARI	F/V CALAMARI INC
GF0273	PACIFIC CHALLENGER	PETERSON, CHESTER T	PACIFIC DAWN LLC	PACIFIC CHALLENGER	PACIFIC DAWN LLC
GF0376	UNIDENTIFIED	GREEN, DONALD WESLEY	PACIFIC DAWN LLC	UNIDENTIFIED	PACIFIC DAWN LLC
GF0279	CAPT. RYAN	M/V LILY MARLENE INC	MORRISON, THOMAS H	CAPT. RYAN	MORRISON, THOMAS H
GF0435	GOD'S WILL	CAPT NICE INC	UNDER GOD'S WILL INC	GOD'S WILL	UNDER GOD'S WILL INC
GF0665	OCEAN BEAUT	BARTLEY, RONALD W AND BARTLEY, ANNETTE M	F/V OCEAN BEAUT INC	OCEAN BEAUT	HODGES MICHAEL E AND JOHN MORELAND FISHING INC
GF0689	BRANDY	HOCKEMA FISHING INC	F/V BRANDY INC	BRANDY	F/V BRANDY INC
GF0078	PACIFIC FUTURE	BLUE WATER FISHERIES INC	PACIFIC FUTURE LLC	PACIFIC FUTURE	PACIFIC FUTURE LLC
GF0126	SEA PRINCESS	NOYO MARITIME INC	SEA PRINCESS LLC	SEA PRINCESS	SEA PRINCESS LLC
GF0315	PRIVATEER	DODSON, DONALD E AND DODSON, BERNADINE L	PACIFIC CHOICE SEAFOOD COMPANY	JO MARIE	PACIFIC CHOICE SEAFOOD COMPANY

Table 5 – Permits and Ownership Change from January 1, 2004 to January 1, 2008

PERMIT	2004 Vessel	2004 Owner	Current Data Set (fall 2006)	2008 Vessel	2008 Owner
GF0323	UNIDENTIFIED	LIBERTY RIDGE SEAFOOD INC AND BANK OF AMERICA NW NT AND SA DBA SEAFIRST BANK	S & S SEAFOOD CO INC	PRIVATEER	S & S SEAFOOD CO INC
GF0417	UNIDENTIFIED	SYLVESTER, EDWARD J AND SYLVESTER, LUPE G	PACIFIC CHOICE SEAFOOD COMPANY	UNIDENTIFIED	PACIFIC CHOICE SEAFOOD COMPANY
GF0956	PACIFIC HOOKER	JOHNSON, CARROLL R	PACIFIC HOOKER LLC	PACIFIC HOOKER	PACIFIC HOOKER LLC
GF0351	PACIFIC PRINCE	PACIFIC PRINCE LICENSE PARTNERS	AMERICAN SEAFOODS COMPANY LLC	PACIFIC PRINCE	AMERICAN SEAFOODS COMPANY LLC

A-4 Halibut Individual Bycatch Quota (IBQ)

TIQC Questions on Halibut IBQ

Is trawl caught halibut a conservation issue?
No. The International Pacific Halibut Commission (IPHC) manages the conservation and sustainability of the Pacific halibut resource by conducting an annual coastwide stock assessment, and developing and setting directed fishery catch limits. IPHC accounts for bycatch mortality in an area prior to setting the catch limits for the directed halibut fisheries. Halibut individual bycatch quota (IBQ) could provide a way to proactively and effectively account for bycatch of halibut in the trawl fishery, which is an objective of the Trawl Rationalization program.

Is trawl caught halibut an allocation issue?
Yes. As in all areas, Area 2A has a Total Constant Exploitation Yield (TCEY), and the estimated amount of trawl bycatch of halibut is taken off the top of the Area 2A TCEY. The trawl caught halibut subtracted from the TCEY is expressed in pounds of legal-sized halibut mortality. Under the Trawl Rationalization program, all bycatch will likely be accounted for. If the trawl bycatch of halibut increases, or is more than what is currently being estimated, then the trawl sector bycatch may constrain directed halibut fisheries inseason and/or in the future. If the trawl sector mortality is stabilized then the likelihood of the trawl fishery pre-empting directed halibut fisheries is minimized. Conversely, if it increases, the allocation to the directed fisheries goes down.

How is Constant Exploitation Yield (CEY) determined?
CEY is the yield associated with an exploitation rate, which when applied to the entire population would achieve something like maximum sustainable yield (MSY), maximum sustainable production (MSP), optimum sustainable yield (OSY), etc. TCEY is the product of the exploitable biomass times the exploitation, or harvest, rate. TCEY is expressed in terms of legal-sized halibut, since the primary target halibut fishery can only retain and land legal-sized halibut.

How is the halibut bycatch rate in the west coast trawl fishery currently determined?
The halibut bycatch rate in the west coast trawl fishery is based on data from the West Coast Groundfish Observer Program, including observed rates of bycatch and stratified by season, depth, latitude and amount of arrowtooth flounder catch. Effort information is from Oregon and Washington trawl logbooks.

What are the factors that determine mortality, and do they include sublegal halibut? If so, should there be Quota Shares (QS) for sublegal halibut?
For Area 2A, the discard mortality rate (DMR) is 50 percent of total catch, and mortality of legal and sublegal are treated the same. At this time, the DMR is based on some historical average and is not based on condition/release data collected by observers. Although using the observed condition may be possible depending on observer coverage, the current percentage of observer coverage is not extensive enough. In British Columbia

(B.C.), where the trawl fleet has near 100 percent observer coverage, the DMR is based on observed condition and in some instances is lower than 50 percent. IPHC studies have found that discard mortality in trawl fisheries is dependant on the size of the fish, the target fishery, and the duration and size of the trawl haul. The IPHC staff recommends that tradable quota shares/pounds apply to all halibut of any size to be fully effective at managing bycatch, same as the B.C. Individual Vessel Quota (IVQ) program.

How are these [bycatch rate] estimates generated for west coast areas, which data is being used, and what does it show?
The bycatch rate estimates are generated by National Marine Fisheries Service (NMFS) Northwest Region using West Coast Groundfish Observer Program (WCGOP) halibut bycatch information, stratified by season, depth, latitude and amount of arrowtooth flounder, and multiplied by effort in each stratum using Oregon and Washington logbook information. In the 2007 NMFS report by Hastie and Wallace halibut bycatch was estimated to be 923,693 lbs. in 2003, declined to 489,882 lbs. in 2004, then increased to 715,752 lbs. in 2005, and was 666,782 lbs. in 2006. In order to compare those numbers to the TCEY, the legal-sized mortality were estimated in the same NMFS report as follows; 366,745 lbs (2003); 171,754 lbs. (2004); 228,049 lbs. (2005); and 251,507 lbs (2006).

What did they do in Area 2B to get the mortality down?
Up until 1995, before trawl rationalization, the B.C. trawler fishery was estimated to have taken 1.5-1.7 million pounds of halibut bycatch mortality annually (all sizes). At the onset of the IVQ program, a cap of 1 million pounds was established by Canada's Department of Oceans and Fisheries for the B.C. trawl sector. In 1996, after implementation of the trawl IVQ management program and an IBQ program for managing the halibut bycatch, bycatch was just under 300,000 pounds. Reasons for this large reduction include: the concurrent decline of the cod fishery; avoidance behavior by harvesters; and slower conduct of fishing operations. In addition, 100 percent observer coverage allowed quick and accurate feed back to the skipper of pounds of halibut caught and discarded each trip.

Is the trawl share of Pacific halibut based on abundance, mortality, or catch?
Currently the trawl fleet has no cap on the amount of halibut caught, discarded or killed. The estimated mortality of the legal-sized halibut comes from the WCGOP. Thus, the basis of the accounting of halibut mortality in the groundfish trawl fishery is catch. Mortality is estimated using the 50 percent discard mortality rate.

Submit a request to Northwest Fishery Science Center (NWFSC) for the halibut catch information in the bottom trawl fishery (we have all the other sectors information currently).
Request drafted for finer scale geographic information on trawl halibut bycatch.

Consider whether different bycatch rates in the Vancouver and Columbia management areas would produce different IBQ allocations. Would this be an issue for those who fish near that dividing line?

Halibut bycatch rates are different in the two areas. There is no biological reason to divide Area 2A into finer scales of management, and therefore a policy matter. The Council may wish to base initial allocation of IBQ on the different rates of bycatch in the two areas, but after initial allocation IBQ would be tradable to anywhere in Area 2A and would not be tracked by sub-area.

From what pool would the Halibut IBQ be allocated? In other words, we don't have an ABC/OY for this species so what would the starting amount be for IBQ shares? Should that amount be determined through the Intersector Allocation process? Or could the assumed catch amount in the trawl fishery be the starting point?

A cap on the amount of halibut caught by the trawl sector is necessary to determine quota shares and quota pounds. The cap could be based on past catch amounts, it could be a poundage amount or a percentage of the CEY or directed fishery catch limit, and the cap could ramp down over time. Washington Department of Fish and Wildlife (WDFW) has developed a draft proposal on how to link the cap to the Area 2A directed fishery catch limit (see proposal attached). The best place to deal with the establishing the halibut IBQ pool would be under Fishery Management Plan (FMP) Amendment 21 on Intersector Allocation.

Would recent catch history be used to reflect the establishment of Rockfish Conservation Areas (RCA), or would it be better to look at a longer range of years because the abundance of halibut varied?

Before 2002, the estimate of the trawl fishery halibut bycatch mortality was based on NMFS gear experiments involving limited fishery observations. After 2002, the bycatch rate and estimated amounts were based on the West Coast Groundfish Observer program, which more closely reflects the fishery today under the RCA configuration. The halibut bycatch cap could also be linked to current halibut abundance, as in the WDFW draft proposal.

WDFW DRAFT

PROPOSED PROCESS FOR ANNUAL HALIBUT INDIVIDUAL BYCATCH QUOTA (IBQ) UNDER TRAWL RATIONALIZATION PROGRAM

Current Process

- National Marine Fisheries Service Northwest Fisheries Science Center produces annual report using West Coast Groundfish Observer Program data to estimate bycatch of legal-sized halibut in trawl fishery

- Report presented to Pacific Fishery Management Council (PFMC) November of following year (i.e., trawl bycatch estimate for 2006 presented in November 2007)

- Annual Total Allowable Catch (TAC) set by International Pacific Halibut Commission (IPHC) in January
  - Using stock assessment and survey data, determine harvestable amount of halibut in Area 2A (West Coast)
  - Subtract trawl bycatch estimate from harvestable amount to set annual TAC
  - TAC distributed to directed and incidental fisheries (tribal, commercial, and recreational) through PFMC Catch Sharing Plan

Problem

Trawl sector quota and individual quotas need to be set in advance of start of fishing year; waiting until January IPHC meeting to determine trawl and IBQ amounts is not feasible.

Proposed Process

- Set trawl sector allocation based on proportion from 2005-06 time period (~15%)
- Apply to previous year's TAC to calculate amount (sector quota, quota shares, and quota pounds)
- Annual TAC set by IPHC in January
  - Using stock assessment and survey data, determine harvestable amount of halibut in Area 2A
  - Subtract trawl sector quota from harvestable amount to set annual TAC

For example:

1. IPHC sets TAC for 2010 at 1 million lbs and trawl rationalization (and trawl IBQ at 15%) becomes effective 2011
2. Using 2010 TAC, trawl IBQ set at 150,000 lbs. for 2011
3. In 2011, halibut TAC reduced to 900,000 lbs
4. Harvestable TAC for 2011 would be 900,000-150,000 = 750,000 lbs (to be shared according to catch sharing plan)
5. In 2012, halibut TAC increased to 1 million lbs. Using 2011 TAC, trawl IBQ set at 135,000 for 2012 (which is 15% of 900,000 lbs)
6. Harvestable TAC for 2012 would be 1,000,000-135,000 = 865,000 lbs

B-2.2.1.a Catcher Vessel Mothership Whiting Endorsement Qualification and History Assignment

The figure illustrates total shoreside and mothership whiting "allocations" for two different combinations of qualifying periods: 1994-2003 shoreside and 1997-2003 mothership on the vertical axis; and 1994-2003 for both shoreside and mothership on the horizontal axis. Points represent permits. Permits along the diagonal line are relatively unaffected by the different formulas. The table shows participation pattern of permits in the whiting fishery. For each year it is indicated whether the vessel participated in the shoreside whiting fishery (S), mothership whiting fishery (M), or both (MS). The right hand columns show the proportion of each vessel's total years of participation in each sector during 1994-2003 that occurred between 1994 and 1996. If the 1997-2003 allocation period is used for the mothership sector, then those permits participating in the shoreside fishery early, and in the mothership fishery late, would benefit (see for example, rows one and two).

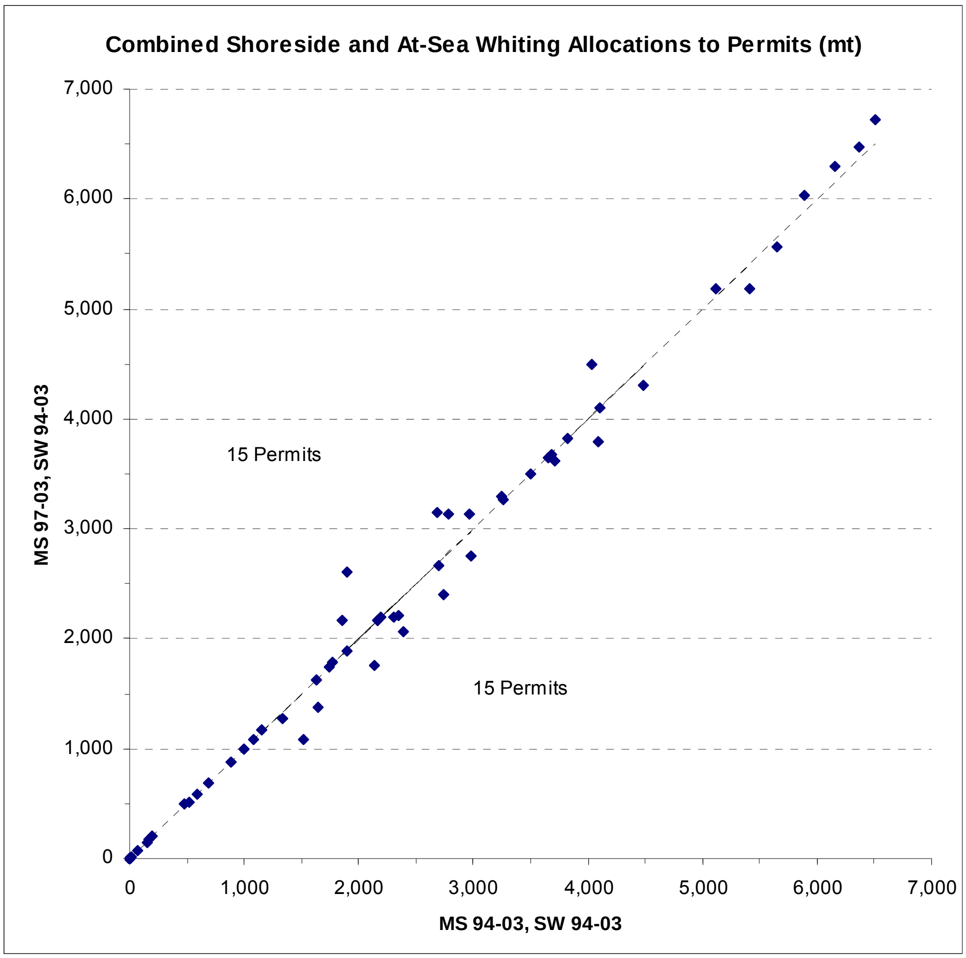

Table 6. Participation in shoreside (S), mothership (M) and shoreside and mothership (MS) fisheries by permit (rows) and years (columns), number of years of shoreside participation in 1994-1996 (S or MS) as a proportion of total years of shoreside participation 1994-2003 (S or MS), and number of years of mothership participation in 1994-1996 (M or MS) as a proportion of total years of mothership participation 1994-2003 (M or MS)

													Count of Years				
Permit	94	95	96	97	98	99	00	01	02	03	04	05	06	Mother-ship only	Shore-side only	Mother-ship and Shoreside	94-96 Shoreside Years as a Proportion of 94-03 Shoreside Years	94-96 Mothership Years as a Proportion of 94-03 Mothership Years
1	S	S	S	S	M	MS	MS	M	M	M			M	5	4	2	0.50	
2	S	S	S	S	M	M	M	M				M	M	6	4		0.75	
3	MS	S	S	S	S		S			S	S	S	S		9	1	0.30	1.00
4	S	MS	S	S	S	S	S	S	S	S	S	S	S		12	1	0.23	1.00
5	S	MS	S	S											3	1	0.75	1.00
6	S	MS	S	MS	S	S		S	S	S					7	2	0.33	0.50
7	MS	S	S	MS	MS	MS	S					M	M	2	3	4	0.43	0.17
8	M	S	S	MS	MS	S	S	S	S	S		S	MS	1	8	3	0.18	0.25
9	MS	S	MS	MS	S	S	S	S	S	S	S	S	S		10	3	0.23	0.67
10	MS	S	MS	MS	MS	MS	MS	MS	S	S	S	MS	MS		4	9	0.23	0.22
11	MS	S	MS	MS	MS	MS	MS	MS	MS	S	S	S	MS		4	9	0.23	0.22
12	MS	S	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS		1	12	0.23	0.17
13	MS	MS	S	MS	MS	MS	MS	MS	S	S	MS	MS	MS		3	10	0.23	0.20
14	MS	MS	S	MS	MS	S	S	S	S	S	S	S	S		9	4	0.23	0.50
15		S			M	M	M	M	M	M	M			7	1		1.00	0.00
16	MS	MS	MS	MS	MS	MS	MS	S	S	S		S	MS		4	8	0.25	0.38
17	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS			13	0.23	0.23
18	MS	M	MS	M	MS	MS	MS	MS	MS	MS	MS	MS	MS	2		11	0.18	0.23
19	MS	M	M	M	M	M	M	M	M	M	M	M	M	12		1	1.00	0.23
20	MS	M	M	M	M	M	M	M		M		M	M	10		1	1.00	0.27
21	M	MS	MS	MS	MS	MS	MS						MS	1		7	0.29	0.38
22	M	MS	MS	M	M	M	M	M	MS	M	MS	MS	MS	7		6	0.33	0.23
23			MS	MS	MS	MS	MS						S		1	5	0.17	0.20
24	M	M	M	M	M	M	M	MS	S	S	S	MS	MS	7	3	3		0.30
25	M	M	M	M		M		MS		S	S	S	S	5	4	1		0.50

Table 6. Participation in shoreside (S), mothership (M) and shoreside and mothership (MS) fisheries by permit (rows) and years (columns), number of years of shoreside participation in 1994-1996 (S or MS) as a proportion of total years of shoreside participation 1994-2003 (S or MS), and number of years of mothership participation in 1994-1996 (M or MS) as a proportion of total years of mothership participation 1994-2003 (M or MS)

														Count of Years				
Permit	94	95	96	97	98	99	00	01	02	03	04	05	06	Mother-ship only	Shore-side only	Mother-ship and Shoreside	94-96 Shoreside Years as a Proportion of 94-03 Shoreside Years	94-96 Mothership Years as a Proportion of 94-03 Mothership Years
26	M	M	M	MS	MS	M	M	M				M	M	8		2		0.30
27	M	M	M	M	M	MS	MS			M		M		7		2		0.33
28	M	M	M	M	M	M	M	M	M	M	M	M	MS	12		1		0.23
29			M			MS	MS							1		2		0.33
30			M	M	M									3				0.33
31		M	M	M	M	M	M	M	M	M	M	M	M	12				0.17
32	M	M	M				M	M	M	M	M	M	M	10				0.30
33	S	S	S	S	S	S	S	S	S	S	S	S	S		13		0.23	
34	S	S	S	S	S	S		S		S	S	S	S		11		0.27	
35	S	S	S	S	S		S	S	S	S	S	S	S		12		0.25	
36	S	S	S	S	S	S	S	S	S	S	S	S	S		13		0.23	
37	S	S	S	S	S	S									6		0.50	
38	S	S	S	S	S	S	S	S					S		9		0.33	
39	S	S	S	S	S			S	S		S	S	S		10		0.30	
40	S	S	S	S		S	S	S	S	S	S	S	S		12		0.25	
41	S	S	S	S			S								5		0.60	
42		S	S	S											3		0.67	
43		S	S												2		1.00	
44	S			S			S	S	S	S	S	S	S		9		0.11	
45		S													1		1.00	
46		S		S											2		0.50	
47			S	S	S			S		S			S		6		0.17	
48			S	S	S	S	S	S	S	S	S	S	S		11		0.09	
49			S	S	S										3		0.33	
50				S	S	S	S	S	S	S	S	S	S		10			

Table 6. Participation in shoreside (S), mothership (M) and shoreside and mothership (MS) fisheries by permit (rows) and years (columns), number of years of shoreside participation in 1994-1996 (S or MS) as a proportion of total years of shoreside participation 1994-2003 (S or MS), and number of years of mothership participation in 1994-1996 (M or MS) as a proportion of total years of mothership participation 1994-2003 (M or MS)

														Count of Years				
Permit	94	95	96	97	98	99	00	01	02	03	04	05	06	Mother-ship only	Shore-side only	Mother-ship and Shoreside	94-96 Shoreside Years as a Proportion of 94-03 Shoreside Years	94-96 Mothership Years as a Proportion of 94-03 Mothership Years
51				S	S	S	S	S	S	S	S	S	S		10			
52				S		S				S					3			
53				S		S	S	S	S		S	S	S		8			
54					S	S		S	S	S	S	S	S		8			
55					S	S	S	S	S	S	S	S	S		9			
56					S	S	S								3			
57					S										1			
58					S										1			
59						S									1			
60							S	S							2			
61								S	S		S				3			
62								S							1			
63										S					1			
64											S	S	S		3			
65													S		1			
66													S		1			
67													S		1			
					Count of Permits													
M	9	10	11	10	11	10	10	10	6	9	5	9	8					
S	15	23	24	24	21	20	20	24	22	26	23	22	25					
MS	13	9	10	14	13	13	12	8	5	3	5	7	12					

GROUNDFISH MANAGEMENT TEAM REPORT ON AREA MANAGEMENT UNDER TRAWL RATIONALIZATION

Introduction

Currently, the Council uses latitudinal and depth-based spatial management measures, as well as gear restrictions, to achieve area management objectives. Latitudinal area management is outlined in the acceptable biological catch (ABC) and optimal yield (OY) tables within the biennial specifications (e.g., North 40°10 N. Latitude and South 40°10 N. Latitude) and in the trip limit tables where, in some instances, limits differ from the ABC/OY delineations because of bycatch considerations. These subdivisions were created based on species abundance and stock assessments results. Regulations relative to rockfish conservation areas (RCA), boundaries which approximate various isobaths along the coast, achieve depth-based area management. Gear restrictions have also been implemented to achieve area management. For example, large footrope gear restrictions for bottom trawlers have been used to limit access to rocky habitat, areas that depleted rockfish species inhabit.

As evidenced by the March 2007 groundfish inseason action, increasingly complex spatial management measures may be necessary within the existing management framework. Intersector allocations and the implementation of trawl individual fishing quotas (TIQ) may further increase the need for spatial management, perhaps in a manner different than status quo. A thorough evaluation of the cumulative consequences of spatial management measures, both current and those expected from future initiatives, should be undertaken. Additionally, research efforts and analyses of current data sources is needed to support more refined area management approaches. This paper considers biological, economic, and administrative aspects of area management as well as their relevancy to the proposed TIQ program.

Biological considerations

A recent National Research Council (NRC) report found that “Spatial analyses may be one of the greatest obstacles faced by fishery managers.” Several literature reviews of contemporary modeling abilities have noted that applied fisheries science has lagged behind more academic research in marine and terrestrial ecology with respect to an increasingly “spatially-rich” interpretation of population structure and complexity (Wilen 2004, Pelletier and Mahevas 2005). 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 increasingly complex and spatially explicit management regimes (NRC 2006).

West Coast groundfish management has clearly become increasingly spatial. In addition to the RCAs, spatial management measures such as “hotspot” or “coldspot” analyses are increasingly available to help identify areas where available target species might be accessed with acceptable impacts on overfished species. Such measures benefit management actions by allowing fishing to occur on healthy stocks while minimizing the bycatch of rebuilding species. Yet the underlying causes and consequences for spatially varying abundance and bycatch rates are often unclear. For example, the RCA configuration adopted in March 2007 to minimize canary rockfish bycatch created a spatial management regime considerably more complex than past management measures, yet this regime was implemented without the knowledge of whether the differences in high versus low bycatch rates by area reflected habitat association and stock distribution, or historical patterns of depletion that leave depleted (low bycatch) regions more vulnerable to localized depletion. There are also some legitimate concerns that the implementation of a TIQ program could result in the spatial concentration of fishing effort. Over larger spatial scales, such issues speak not only to the potential impacts of localized depletion, but to issues of equity with respect to historical exploitation rates and subsequent allocation of allowable catches.

The Cape to Cape group suggested that management of West Coast fisheries would benefit by matching the spatial scales of interest for coastal communities with those scales naturally found within marine ecosystems. The evidence reviewed in that statement suggests while nearshore ecosystems exhibit marked regional differences in their species composition, dynamics and productivity, and the specialization of associated fishery, offshore ecosystems (particularly the slope ecosystem and species) tend to have more population connectivity and more homogenous distribution and life history characteristics. Yet even at a coastwide scale, spatial differences in fishing mortality can lead to altered perceptions of stock status depending on the spatial scale at which a given stock is assessed. For example, sensitivity analysis of different stock boundaries for the shortspine thornyhead stock assessment in 2006 demonstrated that overall depletion and status was considerably more optimistic with a coastwide assessment relative to an assessment that only included the four International North Pacific Fisheries Commission (INPFC) areas north of Point Conception.

Spatially-explicit management has proven to be critical to meeting conflicting management goals and objectives, such as maintaining fishing opportunities on healthy stocks while reducing incidental catches of rebuilding species, and meeting habitat protection requirements. Furthermore, there is a growing appreciation of the significance of heterogeneity in population structure for most marine organisms, as well as for the potential interaction between population structure and fishing behavior, that scientists and managers alike will find increasingly necessary to confront in population models and management measures. An example is the research that has been presented to the Council which recommended the need to spatially preserve larger, older females in rockfish populations to enhance larval viability and survival (Berkeley, et al 2004).

The GMT has frequently recommended that a more strategic consideration of the cumulative consequences of spatial management measures be undertaken, and that efforts be made to develop information to support more refined area management approaches. Current spatial management utilizes six INPFC boundaries and twenty two other available management lines (Agenda Item E.5.b, GMT Report, March 2007). However, these management lines may not represent natural stock breaks. A concerted research effort to compile and review available data on landings, survey indices, population structure and other factors could be part of a long term strategy to inform area management. As part of this effort, the GMT recommends accessing the expertise and information being developed outside the immediate Council process with regard to spatial management (e.g., the PMCC "Cape to Cape" Workshop and the upcoming Temperate Reef Workshop). Additionally, an ecosystem based fishery management plan could act as a coordinating mechanism for evaluating and perhaps implementing spatial management measures. However, it may be unlikely that these overall efforts will provide sufficient information in time to inform further spatial division of quota shares beyond our current OYs prior to the planned implementation of the TIQ program. The GMT recommends incorporating current area management tools within the TIQ program, recognizing the limitations, and continue to pursue research and data that may further inform spatial management. As data become available, area management within the TIQ program is expected to evolve and adapt.

Economic considerations

Area management within a TIQ program has the potential to generate both positive and negative economic impacts. Positive economic impacts may occur at a regional level if IFQ shares are area based. Catch harvested from an area-specific IFQ would most likely be landed in adjacent ports, which would disperse economic activity along the coast, providing community stability, as opposed to being concentrated in a few regions. However, creating area-specific quota could also have negative economic impacts. The fishing industry requires the flexibility to adapt to changing market conditions and quota shares based on small geographic scales may reduce this flexibility. For example, non-whiting trawl vessels in the Astoria fleet routinely travel to areas near the US/Canada border. Area-specific quota shares could restrict fleet mobility, which may limit access to target species that are not evenly distributed along the coast. Additionally, finer scale area-specific quotas could restrict the fleet's ability to adapt to market changes. In order to avoid this situation, care should be taken when creating area-based quota so that area-specific IFQ shares are not so small as to erode the economic gains typical of rationalization programs.

Administrative considerations

The feasibility of implementing area-based management and the ability to adapt to area-based scientific information, after the implementation of a rationalization program, are important considerations. An overly complex program designed to achieve area-based management objectives may increase operational costs and may be too bureaucratic to adapt to changing fishery and environmental conditions. Area-based quota shares substantially increase program complexity because each area may require quota shares by species, by permit, a set of minimum holding requirement rules, and a set of concentration-of-ownership rules amongst others. When determining the number of areas with quota share designations, administrative cost and burden should be balanced with economic and biological considerations.

In addition, a program that is too rigid to adapt to new scientific information (such as information suggesting a modification of area-based management tools) may result in a fishery that is unable to easily take into account negative biological consequences that may be occurring. In order to avoid this scenario, information can be collected in a rationalized fishery that could be used to modify area-based quota share allocations if necessary. For example, location of catch by vessel could continue to be recorded in a rationalized fishery and used in a manner to re-assign shares on an area basis. It may be prudent to specifically identify evaluation of the adequacy of any existing area-based quota management as part of the periodic routine review being considered for the TIQ program.

Data Sources

- Retained catch data by area from trawl logbooks
- Spatial distribution of West Coast Groundfish Observer Program (WCGOP) data
- Spatial distribution of National Marine Fisheries Service (NMFS) trawl survey data
- Landings data by port from RecFIN. These data could also be summarized by the 6 INPFC areas

The GMT has requested from the Northwest Fisheries Science Center the catch data, WCGOP data, and NMFS trawl survey. Landings data by port (1994-2005) are already available from information assembled for the GAC. The GMT will review this information, once available, and then identify potential remedies. However, the entire analysis likely cannot be completed in time for TIQ or intersector allocation.

GMT Recommendations

1. The GMT recommends that the TIQ program incorporate area management tools currently in use and continue to pursue data and research informing spatial management. Depending on the results of the data compilation and review, determine whether and how spatial management concepts could be used in developing fishery management measures for the 2009-2010 biennium as well as the development of an Ecosystem Fishery Management Plan.

PFMC
05/25/07

Sources

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PFMC
06/10/08 2:50 p.m.

Groundfish Allocation Committee

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May 13-15, 2008

The Groundfish Allocation Committee (GAC) met May 13-15 and developed the following recommendations for the Pacific Fishery Management Council (Council).

Rationalized Management of Sectors

- **The GAC recommends the Catcher/Processor (C/P) fleet be managed as a co-op.**

Rationale and comments: The benefits of a C/P co-op, including simplified management for National Marine Fisheries Service (NMFS) and good bycatch performance by this sector, are compelling reasons to go forward with the co-op option for the C/P fishery.

At the same time, some GAC members expressed two specific concerns about the co-op alternative. One of the concerns had to do with whether or not under this alternative the C/P co-op could dissolve into a derby fishery, and the other had to do with whether the co-op would be obligated to accept as a member anyone with a permit for a C/P vessel. Because there would not be a specific allocation other than that made to the C/P sector as a whole, under the proposed alternative if some vessels leave the co-op, the fishery could revert to a race for fish. Those vessels that leave the C/P co-op would not be able to take a portion of the C/P allocation with them for harvest in a separate non-co-op fishery, unlike co-ops proposed for the mothership (MS) and shoreside (SS) sectors. The harvest amount would be given as a whole to the C/P sector. To prevent a derby, non-co-op vessels would need a separate pool of target and bycatch fish, otherwise the non-co-op vessels could try to take as much of the sector share as they are able. If one of the C/P permits is sold to a new owner that is was willing to abide by the co-op contract, could that owner join the co-op automatically, or would the existing co-op have authority over accepting the new entrant? These are both problems that could come up, which the Council may have to fix later rather than trying to craft the program in anticipation of these particular problems.

This recommendation would create a closed class or a limited access system, which is not the same as a Limited Access Privilege Program (LAPP) as defined in the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Participation in a C/P co-op alternative would be entirely voluntary. If the Council determines that a greater degree of regulatory authority is needed some changes would be required to make it a regulatory co-op.
Changes would also be required if the Council wishes the C/P co-op alternative to fit within the MSA definition of a LAPP.

The GAC recommends the Mothership whiting sector be managed as a co-op and identified the following as preferred options:

Topic	Sections	GAC Recommendations
		For All Whiting Sectors (B-1)
Annual Whiting Rollovers	B-1.2	Option 1: No rollover of unused whiting between sectors.
Bycatch Allocation Subdivision	B-1.3.1	Subdivision Option D: Subdivide bycatch allocation among whiting sectors and within sectors subdivide between co-op and non-co-op, and between co-ops.
Bycatch Management	B-1.3.2	Rollover Option 1: Unused bycatch maybe rolled over between sectors.
		No preferred option identified for bycatch buffer between co-op and non-co-op.
Mandatory Data Collection	B-1.5	No preferred option identified.
Adaptive Management	B-1.6	Up to 10% Adaptive Management (see detail in this report below).
		Mothership (MS) Sector (B-2)
Participation	B-2.1.c	Option 1: Vessel may not operate as a MS during a year in which it participates as a C/P.
Catcher Vessel Endorsement Qualifying Requirements	B-2.2.1.a	No preferred option for qualification or catch history years. Catch History Assignment: Keep current option and add 1994-2003 in for analysis,
Whiting Endorsement Transferability	B-2.2.1.b	Transfer Option 2: Whiting endorsement may be severed from permit and transferred.
Accumulation Limits	B-2.2.1.c	No preferred option identified.
MS Qualifying Entities	B-2.2.2.a	No preferred option identified.
Transferability	B-2.2.2.c(3)	Option 1: MS permit may not be transferred to a vessel engaged in harvest of whiting in the year of transfer.
	B-2.2.2.c(4)	No preferred option identified.
Usage Limit	B-2.2.2.d	No preferred option. Add in a 40% option for analysis.
Number of Co-ops	B-2.3.1	Co-op Formation Option 2: Multiple co-ops not required.
Co-op Agreement Standards	B-2.3.3	Waiting on NOAA GC opinion. No preferred option identified.
Processor Ties Formation of Ties	B-2.4 B-2.4.1	Option 1: Obligated delivery is 100% (all). Option 1: Obligated deliveries are based on deliveries made in the most recent year that a C/V fished before rationalization.
MS Withdrawal	B-2.4.3	No preferred option identified.

Gray = GAC did not identify a preferred option.

Rationale: A group representing a majority of the participants in this sector indicated that they prefer a co-op alternative. The GAC reviewed the general recommendation and specific options of this group as well as the minority positions and accepted the group's recommendations with certain exceptions. There may be a problem with using different catch history years for qualification and allocation and therefore there was no preferred alternative selected by the GAC for section 2.2.1 and an option was added for the allocation period (1994-2003). Another percentage (40%) was added to the Usage Limit (B-2.2.2.d) options to allow consolidation of the harvest to as few as three MS. This level of consolidation may be appropriate for efficient operations if there is a decline in the whiting biomass. For the Bycatch Allocation Subdivision provision (B-1.3.1), Options C and D are not different if only one co-op is formed. However, if there is more than one co-op, bycatch should be subdivided between co-ops. Option D, which the GAC recommended, would provide for that instance.

General GAC Guidance: The GAC asked the industry advisors for further explanation of "most recent year" meant with respect to the formation of processor ties – whether that was the implementation year, and further, what if implementation occurred in stages? The proponents of an MS co-op should be prepared to address those questions before the Council at the June meeting.

- The GAC recommends the trawl fishery be managed as 3 sectors (i.e., combine shoreside whiting and shoreside non-whiting into a single sector).

Rationale: Market flexibility and other advantages are greater under three sectors than under four. A single shoreside sector will help resolve bycatch allocation issues for the shoreside whiting fishery. Although the GAC understood the concerns about problems when one sector bleeds into another, there was greater concern over putting burdensome restrictions on a new program. Non-whiting vessels would be substantially better off as a result of rationalization, making it unlikely that whiting vessels would financially dominate non-whiting vessels by acquiring QS.

- The GAC recommends the single shoreside sector be managed with individual fishing quotas.

Rationale: The large number and wide diversity of participants and fishing strategies in this sector make it most conducive to management by individual fishing quotas, as identified and supported by the analysis presented by the Council staff.

Initial Allocation of Quota Shares (QS) to Processors

- The GAC recommends no initial allocation of quota shares for processors.
  (NMFS abstained from voting.)

Rationale: In reaching this recommendation, the following factors were noted in the GAC discussion:

1. An initial allocation of quota shares to processors may erode the personal accountability for bycatch that QS are supposed to provide. A major goal of the program is to maintain mortality of overfished species within the limits specified in the rebuilding plans. To achieve this we need to clearly put responsibility on the fisherman and give them incentives for innovations that will allow them to increase their catch of target species while decreasing overfished species bycatch rates. Starting out with an initial allocation of QS to fishermen clearly puts the responsibility on fishermen.
2. While QS may be transferred to processors after the initial allocation, the two are quite different. The initial allocation is a decision made by the government while the subsequent distribution among sectors will be driven by each person's individual business decisions to buy and sell. For an entity that is granted the QS as part of the initial allocation, the incentives for optimal use, and hence for personal accountability, will be less than if they have to buy that allocation through the market place.
3. The bycatch rate reduction expected with an initial allocation to fishermen will result in increased landings of target species which will benefit the entire industry, including processors.
4. The language of the MSA indicates a strong intent to recognize harvesters.
5. Ultimately, both sides will benefit from the program and there is not a large disadvantage if processors are not given shares initially.
6. There is limited evidence on the need for an allocation to processors and the ramification of such an allocation is unclear. It does not appear that an allocation to processors will address concerns about the geographic distribution of harvest.
7. Consolidation is a concern and an initial allocation to processors may lead to greater consolidation.
8. The analysis indicates that currently there is not a level playing field between harvesters and processors and an initial allocation to processors may exacerbate that imbalance, especially given the degree of consolidation in the processing sector.
9. Long established relationships between processors and harvesters will continue to exist, there will not be widespread disintegration and relocation of these relationships.
10. The history of development of this program encompasses the identification of a continued harvester overcapacity problem and conception of the buyback program in 1996, the groundfish strategic plan, and the bycatch reduction amendment. The success of this long-term effort requires protection for those established in the fishery in order to increase the economic stability for all.

Also cited were a number of the summary points at the start of "Competitiveness" under the section for harvest vessels in the "Impact on Sector Health" section of A-2.1.1a in Appendix A.

It was noted that in other rationalization programs, such as crab rationalization in the North Pacific, certain safeguards are built in to protect communities and the market power balance. But those safeguards are not built into this west coast rationalization program. Without those safe guards, greater consolidation could happen along the coast. Initial allocation to processors does not guarantee survival of communities or address concerns about geographic shifts of processing.

In response to a question about the timing of the response to a request to the Department of Justice for a legal consultation around issues of concern related to allocation to processors and consolidation, National Oceanic and Atmospheric Administration General Counsel indicated that a response might be forthcoming this fall but would be dependent on litigation related workload in the intervening period.

<u>Adaptive Management</u>

- The GAC recommends the Adaptive Management option. The option should be specified to take up to 10 percent of the quota pounds off the top of each sector's allocation before distribution to the QS holders. Adaptive management Quota Pounds (QP) would be redistributed within the sector from which they were derived.

<u>Rationale:</u> Potential uses for Adaptive Management quota pounds included reducing processor harm, sustaining coastal communities, facilitating new entrants, and promoting and rewarding gear conversion and by catch reduction.

The GAC agreed that the opportunity to use adaptive management QP to provide incentives in response to unanticipated outcomes of the program is good to have, but the feasibility and complexity of the adaptive management program would depend on the administrative details. Administration could be either complicated or simple depending on the objectives of the program and criteria used to distribute the quota pounds. If the Adaptive Management provision left the distribution of these quota pounds up to NMFS, there might be an advisory group that would score the proposals and NMFS would do public notice and rule making. As NMFS develops that proposed rule, they would have questions on certain elements that were not totally fleshed out by the Council. NMFS would have to come back to the Council for answers or direction. If, on the other hand, the objectives and criteria are simple, the more complicated NMFS advisory group process could be avoided.

It was noted that the Adaptive Management provision in the draft Environmental Impact Statement (EIS) was vague on purpose because it is intended to be a tool to address unforeseen problems that should be as flexible and simple as possible.

There was general agreement that unused Adaptive Management quota pounds should be released back to the sector quota share holders for use.

An argument against Adaptive Management is that the industry cannot handle a 10 percent reduction off the top and still remain profitable. If there is legitimacy to this, the implementation of the Adaptive Management provision could be suspended for one or two biennial specifications process, two or four years respectively, since it might take some time to understand the unforeseen impacts of the trawl rationalization program.

Review (and elimination, if necessary) of the Adaptive Management provision would always be under the purview of the Council at any time. Formal review of the trawl rationalization program, and any program provisions, would occur four years after program implementation.

Species Coverage

- The GAC requested the Groundfish Management Team (GMT) and the (Trawl Individual Quota Committee (TIQC) look at which species should or should not be managed with quota shares or co-op allocations and make a recommendation to the Council in June 2008.

Formulas for Initial Allocation

- The GAC recommends that the preferred Allocation Formula (A-2.1.3) option is Option 2, an allocation based on equal division of the buy-back permits' pool of QS and allocation of remaining QS based on permit history.
  (NMFS abstained from voting.)

Rationale: Option 2 seemed to be the fairest way to do the allocation. The QS allocation that results from Option 2, shows that no one would be strongly up or down as compared to the recent year average while an allocation based only on catch history showed highly varied results in comparison to recent periods. Option 2 maintains a compromise between equal sharing and current participants.

- For the permit history based portion of the formula (A-2.1.3), the GAC recommends Overfished Species Option 2 for the non-whiting fishery and Bycatch Option 2 for the whiting fishery. Both options are based on target species catch.

Rationale: These options will tend to allocate bycatch species to individuals in the proportion that they need to take the target species QS they are allocated.

- The GAC requested that the GMT evaluate further subdivisions in the bycatch rates for use in the formulas for allocating overfished species. Specifically, the GMT should look at the variation of bycatch in different areas, assess the utility of divisions in addition to the 40° 10' management line, provide more information to the Council in June 2008 regarding the three areas north and two areas south known to have different bycatch rates, and display that information in a simple graph.

Accumulation Limits and Grandfather Clause

- The GAC requested the TIQC look at the Accumulation Limit options and make a recommendation to the Council in June 2008.

Area Management

- The GAC requested the GMT and TIQC look at the Area Management options and make a recommendation to the Council in June 2008.

GAC Schedule of Future Meetings

The GAC will meet on July 9 & 10, 2008 in Portland, OR to discuss Open Access.

The GAC will meet on October 9 & 10, 2008 in Portland to review the draft Trawl Rationalization EIS before the November Council meeting and to review Tracking & Monitoring portion of the trawl rationalization program.

ENFORCEMENT CONSULTANTS REPORT ON AMENDMENT 20: TRAWL RATIONALIZATION ALTERNATIVES

The Enforcement Consultants (EC) have evaluated Agenda Item F.6.a, Alternatives, June 2008, Goals, Objectives, Alternatives, Excerpts from Chapters 1, 2, and 6 of Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery, Preliminary Draft Environmental Impact Statement, and have the following comments.

A-2.3.1, Tracking, Monitoring, and Enforcement

Catch Tracking
The EC endorses and views the catch tracking tools as essential e.g.; electronic vessel logbook reports, electronic Individual Transferable Quota (ITQ) landing reports, and vessel landing declaration reports as outlined on page 56, Table 2-3. The EC believes processor production reports are a valuable source for investigative follow up and conducting in-season audits and inspections.

The EC believes that cost control mechanisms including landing hour restrictions, site licenses, and vessel certifications as outlined on page 56, have merit and should be included in the preferred alternative for analysis. Landing hour restrictions could be particularly useful for enforcement efforts.

Shoreside Catch Monitoring
The EC believes shoreside catch monitoring is critical and endorses the shoreside catch monitoring alternatives found on page 55, Table 2-3.

At-Sea Catch Monitoring
The EC believes that at-sea catch monitoring is essential and endorses the at-sea catch monitoring alternatives outlined on page 55, Table 2-3 with the following caveat: the camera program currently deployed under the Shoreside Whiting EFP and proposed under Amendment 10 is to date an unproven enforcement tool. The past four-year experiment has shown that camera monitoring has potential, but reliability of the equipment has proven to be questionable for compliance monitoring.

As a scientific experiment conducted by the Northwest Science Center, the camera monitoring program lacked enforceable regulations that would readily allow for holding individuals accountable for alleged violations detected by the video images. Timely analysis of the images was also a problem. With the program management moving to a Sustainable Fisheries / NW Division OLE partnership, the supporting regulation package has been tightened up significantly, and video analysis will be done in a timelier manner. The current contractor has made hardware upgrades this year and vessel operators have been counseled on the proper use, care, and maintenance of the equipment. It is hoped that with these changes and guidance, the equipment will prove its reliability.

Behavior of the fleet will also influence the final analysis of camera utility as a compliance monitoring tool. Over the four year history of this program the number of discards and the volume of those discards has decreased annually. The EC sees this as a positive outcome and gives credit to those operators who have contributed to this positive trend. In general, last year 40% of the fleet operated per the required provisions in this year's exempted fishing permit (EFP). Forty percent will need to make small adjustment to their fishing strategy, but 20 percent will need to make considerable adjustments in their fishing strategy. Bottom line, for those 20 percent, the games being played with camera deployment and hiding of discard events needs to stop. Cameras can be beat, if that is the intent of the operator. In this case, the behavior of a few could be jeopardizing the desires of a majority of responsible vessel operators who hope to use cameras as a low cost alternative to human observers either under a Trawl Rationalization Program or under Amendment 10.

A-2.2.1 Permit /IFQ holding Requirements

The EC endorses Sub Elements 1 through 5 found on page 52, Table 2-3, but has the following qualifying comments regarding sub option 4, "For any vessel with an overage (catch not covered by quota pounds [QP]), fishing that is within the scope of the ITQ program will be prohibited until the overage is covered regardless of the amount of the overage."

Per Agenda Item F.6.b, Supplemental Analysis, June 2008, the Council at its November 2007 meeting added the option:

> *"Within the scope of the ITQ program:*
> *An overage* ***will not*** *prevent a vessel from using the following gears to target on non groundfish species, even if there is some incidental groundfish catch: Salmon troll: HMS troll gear and other legal surface hook-gear that also qualify as vertical hook-and-line or dinglebar under the groundfish FMP.*
>
> *Outside the scope of the ITQ program:*
> *An overage* ***will not*** *prevent a vessel from fishing using Dungeness crab gear, and all other HMS gears (including pelagic longline), except small mesh gillnet or purse seine for coastal pelagic species.*
>
> *An overage* ***will*** *prevent a vessel from using small mesh gillnet for highly migratory species."*

In addition, our analysis has concluded that under this alternative an QP overage **will not** prevent a vessel from using Shrimp Trawl gear, or prevent participating in all Alaska fisheries including trawl, any west coast tribal fisheries including whiting and non-whiting trawl, and possibly California halibut. Taken as a whole, there are considerable lucrative options available for a vessel and potentially its crew, if the vessel ownership decides not to cover the vessel's ITQ overage and moves to an alternative fishery.

Viewed in isolation this proposal may have merit if the desired outcome is for the vessel to leave the fishery and become part of the expected consolidation anticipated under Trawl Rationalization. But coupled with Option 6 of A-2.2.1 Permit/IFQ Holding Requirements, the outcome potentially becomes very different.

Option 6 found on page 52, Table 2-3 allows a vessel to resume fishing in the TIQ fishery after laying out for two years and is not required to cover its deficit. Example: A vessel incurs a substantial QP deficit which because of the costs of purchasing QP becomes a substantial expense. Under this option, the vessel can lease or sell its remaining quota pounds or shares and then participate in a large array of fishing alternatives. After a two-year lay out the vessel can return to the TIQ fishery with no penalty, other than the potential criminal and /or civil penalties imposed under the original overage violation. In the interim, the quota shares are transferred to another vessel generating revenue for the share owners, and the vessel moves to another potentially lucrative fishery, while avoiding the expense of covering their initial QP overage.

The EC believes these options, as written, erode incentives for vessels to cover their QP overage, and thus erode the compliance objectives of the program. The EC believes these options need significant modification if they are retained as a preferred alternative.

As a start, the EC proposes that the vessels with QP overages be prohibited from participating in the west coast shrimp trawl and all tribal fisheries. Option 6 should be limited to the overfished species. When the vessel re-enters the fishery under option 6 the vessel shall have a percentage (to be determined through analysis) of the total quota sharing (QS)/QP assigned to the vessel deducted for X number of years (to be determined through analysis). Deducted pounds will be returned to the QS pool and be distributed back to the QS holders through adaptive management, equal sharing, or other means determined by the Council. This proposal is analogues to what occurs in the banking industry when an individual declares bankruptcy. After declaring bankruptcy, an individual pays a premium on future loans (higher interest rates) for a considered length of time. After establishing a pattern of responsibility those premiums disappear.

These are our ideas, but we are sure there are others. We understand the intent of the options under discussion here, and welcome the opportunity to work with the maker(s) of the motion(s) to achieve the original intent. But as written, these two proposed alternatives have consequences that could undermine the compliance, management, and conservation goals of the Trawl Rationalization Program.

A-1.2 IFQ Management Units, Area Subdivision
As outlined in Supplemental Analysis Agenda Item F.6.b, June 6 the Groundfish Management Team (GMT) Report on Amendment 20 from the November 2007 reiterated its recommendation that IQ be allocated on a more refined spatial scale than is currently being considered. In doing so, the GMT noted that care should be taken to balance biological objectives with economic objectives.

The EC has reservations about this alternative in that this approach will add a great deal of regulatory complexity to an already complex program. Complexity equates to increased cost, both in management and enforcement. We agree with the Groundfish Allocation Committee (GAC) and the TIQC that use of the alternative be backed by sound biological analysis.

Staffing
For the past two decades the west coast non whiting trawl fishery has been prosecuted under a cumulative trip limit management scheme. In order to detect violations of cumulative trip limits, enforcement is required to monitor the offloads of individual vessels over the course of a two month period. The opportunity for cheating without detection during this time is great. Vessels can transit across state lines; land in various ports, and off load 24/7. Fishtickets can be falsified, altered over time, and lag beyond the two month period. The scheme is highly reliant upon a

harvester and processor honor system, which places a high degree of risk on the resource. To effectively enforce this scheme, state and Federal enforcement programs must expend large amounts of staff time.

The Council is now considering a trawl rationalization management scheme which would eliminate the current cumulative trip limit management scheme for this sector, and replace this program with a shoreside individual quota management scheme.

For purposes of this discussion, the EC makes the following assumptions: All available tracking data, monitoring data, and information will be fully shared between the three states and OLE. IQ's will be tracked and monitored through an electronic near real time accounting system. 100% of all trips will be monitored. 100% of all off loads will be monitored. These three monitoring and tracking elements will expand "enforcement's eyes" and greatly enhance enforcement intelligence information. The need for monitoring of off loads by commissioned enforcement staff will be lessened. Information regarding these offloads will be available to enforcement in a relatively short time frame. At-sea monitoring of fishing activity conducted by the shoreside trawl sector will be greatly expanded.

There will always be a need for officer presence on the dock, but with a third party monitoring the off loads, that presence can be more focused. State officers, who primarily provide this presence, can be more opportunistic and strategic in their dock side enforcement patrols. Federal investigators' will have expanded, improved, more timely and verifiable intelligence available to them to investigate alleged illegal harvest and reporting activity.

Under an IQ system, the EC believes that the need for additional staff will be minimal. Those needs are one additional commissioned officer in Washington, a Program Manager position established in the NW Division of OLE, and three total support staff assigned to the NW and SW Divisions. With these minimal increases in staffing, the EC believes that the Trawl Rationalization Program as constructed in the proposed alternatives offers west coast enforcement programs a new tool box that will greatly enhance our enforcement productivity and efficiency. Trawl rationalization can be accomplished with minimal or no additional staffing. Trawl rationalization will enhance enforcement by more closely monitoring catch rates and assigning accountability to individual vessels.

It is without question that trawl rationalization is preferred over cumulative trip limits.

In Summary

The Enforcement Consultants recommend the following alternatives be included in the Council's preferred alternative for further analysis:

1. A-2.3.1,

    Catch tracking Mechanisms: electronic vessel logbook reporting, vessel landing declaration reports, electronic ITQ landing reports, processor production reports.

    Cost Control Mechanisms: Landing hour restrictions, site licensing, and vessel certification.

Shoreside Catch Monitoring

At-Sea Catch Monitoring

2. A-2.2.1

Options 1, 2 3, and 5

Options 4 with this modification: in addition to the prohibited gear listed in Agenda Item F.6.b, Supplemental Analysis, June 6, prohibit Shrimp Trawl, and prohibit participation in west coast tribal fisheries.

Option 6 with this modification: option 6 is limited to overfished species. When the vessel re-enters the fishery under option 6 the vessel will have a percentage (to be determined through analysis) of the total QS/QP assigned to the vessel deducted for X number of years (to be determined through analysis). Deducted pounds will be returned to the QS pool and be distributed back to the QS holders through adaptive management, equal sharing, or other means determined by the Council.

PFMC
06/11/08

GROUNDFISH ADVISORY SUBPANEL REPORT ON AMENDMENT 20: TRAWL RATIONALIZATION ALTERNATIVES

The Groundfish Advisory Subpanel (GAP) discussed the current options for the trawl rationalization program and has the following recommendations:

1. The GAP supports the Groundfish Allocation Committee (GAC) recommendations to manage both at-sea whiting sectors with co-ops and the shoreside whiting and shoreside non –whiting fisheries with individual quotas (IQs).

2. The GAP supports the GAC recommendation to combine the shoreside whiting and shoreside non-whiting fishery into one shoreside sector. (Reference A-1.3 from Agenda Item F.6.a. Attachment 1)

3. A majority of the GAP supports the GAC recommendation to adopt an adaptive management program for all sectors (Reference A-3 from Agenda Item F.6.a. Attachment 1).
   a. A majority of the GAP recommends that the adaptive management be clearly defined and include a sunset date.

4. The GAP supports the Groundfish Trawl Individual Quota Committee (TIQC) recommendations for species coverage and secondary management tools (Reference Agenda Item F.6.d, TIQC Report, pages 1 and 2)

5. The GAP supports the GAC recommendation to include an equal sharing element in the initial allocation formula (as it relates to buyback history). (Reference A.2.1.3a Option 2 of Agenda Item F.6.a. Alternatives page 39).

6. The GAP supports the GAC recommendation that bycatch rates should be used to allocate bycatch of severely depleted species (i.e. cowcod and yelloweye).

7. A majority of the GAP supports the TIQC recommendations for the accumulation limits and grandfather clause. (Reference Agenda Item F.6.d. pages 3 & 4).

8. The GAP is not supportive of the area management approach. Restricting vessels and their movement as well as restricting transfer of bycatch limits the flexibility of individual fishermen. The GAP does not believe there is biological evidence for such restrictions at this time. With the equal sharing component supported above, under initial allocation of quota shares individuals will receive quota for species they have never caught or will need in the future and an area management approach may limit their flexibility.

9. The majority of the GAP does not support implementing fixed terms and auctions (Reference Agenda Item F.6.a. Attachment 1, page 5, Section A-6). Fixed terms and auctions degrade the sense of stewardship and value of the quota share. Participants believe they should not have to “buy” back the shares they may have already purchased through the first term of the program and shares will lose value as the term sunsets or an auction nears.

10. The majority of the GAP supports the TIQC recommendation to suspend the length endorsement. (Reference Agenda Item F.6.d, TIQC Report, page 4).

11. The GAP supports the TIQC recommendation to prohibit QS transfers in the first year of the program. (Reference Agenda Item F.6.d, TIQC Report, page 5).

12. The GAP supports the TIQC recommendation to consider an appeals process when an individual has an overage that is difficult to cover because of limited QS availability or excessive prohibitive cost. (Reference Agenda Item F.6.d, TIQC Report, page 5).

The GAP chose not to address the initial allocation to processors or processor linkages in co-ops due to the contention of these issues which have been previously vetted through the process and will likely be addressed through public comment on this agenda item.

PFMC
06/10/08

Agenda Item F.6.d
Supplemental GMT Report
June 2008

GROUNDFISH MANAGEMENT TEAM REPORT ON AMENDMENT 20: TRAWL RATIONALIZATION ALTERNATIVES

The Groundfish Allocation Committee requested that the Groundfish Management Team (GMT) consider certain features of the proposed trawl rationalization program, including area management and the set of species to cover with quota shares. The team agrees that these issues pose important questions and regrets that its agenda did not permit adequate time for discussion at this meeting. The GMT requests opportunity for discussion between now and the November Council meeting.

PFMC
6/11/08

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON AMENDMENT 20: TRAWL RATIONALIZATION ALTERNATIVES

The Scientific and Statistical Committee (SSC) heard from Mr. Jim Seger (Council Staff) regarding the Council's preliminary decision points for the current meeting, and the timeline for completing the Draft Environmental Impact Statement (DEIS) for public review and reporting on progress to Congress. The SSC also received a presentation from Dr. Steve Freese (National Marine Fisheries Service [NMFS] Northwest Region) regarding a preliminary analysis of costs associated with the Trawl Individual Quota Program (TIQ) for data collection, monitoring, enforcement and administration under the status quo and two program alternatives.

The SSC Economics and Groundfish Subcommittees met with the Trawl Individual Quota Analytical Team (TIQAT) on May 28-29, 2008 to review the Preliminary DEIS materials prepared for the Council's June meeting (Agenda Item F.6.b). The full report of that meeting is attached. Below are highlights from the report and some additional comments.

The TIQAT has made significant progress in developing documentation and supporting analyses for the TIQ program alternatives. The Council has to make a complex set of inter-related decisions to implement the TIQ program. Their task and public review of the proposed decisions would be facilitated by documentation that clearly lays out the decisions to be taken and how those decisions relate to the objectives of the program. The SSC subcommittee report suggests changes to the organization and content of the preliminary DEIS as examples of ways to improve the documentation.

The DEIS is supported by several related analyses, with results from one analysis feeding into subsequent analyses. Major analyses pertain to the initial allocation, projections of fleet consolidation and bycatch reduction, and effects on ports.

Initial Allocation

The issue of initial allocation is primarily one of equity and social policy. The gifting of initial quota shares will provide a marketable asset to some individuals and deny it to others. Over the long run, quota shares will tend to gravitate toward the most efficient fishing operations, which will be able to outbid less efficient operations for transfer or lease of quota shares. However, the identities of long term participants in the fishery, their geographic distribution, and the amount of wealth accumulated will, to varying degrees, be influenced by the initial allocation. Further, accumulation limits, grandfather provisions, capital constraints, and personal preferences could have a large effect on the long-term efficiency of the fleet. The adaptive management option could be developed to mitigate short term disruptions.

Fleet Consolidation

The TIQAT used a fleet consolidation model to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program. The results from this model will also be an input into the regional economic impact model and will influence the costs of monitoring, data collection, enforcement and administration.

A standard econometric methodology was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the Northwest Fisheries Science Center (NWFSC). Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced to 40-60 vessels and with cost savings in the range of $18-22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50-60 foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

There is considerable uncertainty regarding the results of the fleet consolidation model. The projected size of the profit-maximizing trawl fleet may be too large, as the model assumes a constant mix of target species before and after rationalization. An individual fishing quota (IFQ) fishery may lead to a fleet with more species specialization and thus have fewer vessels than estimated by the model. On the other hand, fleet size may be underestimated, as the model assumes no constraints on accumulation of quota shares. Also, model results were based on 2004 and 2006 harvests, when optimum yields (OYs) were generally low. Projections of profits probably are low relative to the long term because, as stocks rebuild, future catches are likely to be higher than in 2004 and 2006, and costs are likely to be lower due to specialization in groundfish. Model results pertain to the endpoint of an ideally rationalized fleet, and not the transition to this state. Despite these uncertainties, the model results provide a general idea of the profits and fleet size that might be produced by a rationalized groundfish trawl fishery.

Bycatch Reduction

The TIQAT conducted a trawl bycatch reduction analysis to evaluate the likely potential increase in the harvest of target non-whiting groundfish species. The analysis used observed changes in the bycatch rates of canary rockfish in a 2001-2004 exempted fishing permit (EFP) fishery off Washington and applied them in the NMFS/Groundfish Management Team trawl bycatch model to simulate harvests that could be taken under a rationalized trawl fishery.

The EFP fishery indicated large reductions in the bycatch rates of canary rockfish when the participants in that fishery were allowed to operate under conditions similar to a rationalized fishery. It remains unclear whether these reductions are representative of what might occur under other fishing strategies or in other locations. Because the predictions from the bycatch rate reduction model serve as inputs to other analyses supporting the DEIS, it is important to consider a range of bycatch rate reductions that reflect these uncertainties. The TIQAT considered three scenarios – a low catch scenario based on industry input, and medium and high catch scenarios that assume 35 percent and 50 percent reductions in bycatch rate as observed in the EFP fishery during 2003-2004. It is not clear whether these three scenarios adequately bracket the range of uncertainty; however, very little quantitative information exists for projecting potential bycatch rate reductions.

Effects on Ports

A qualitative analysis examined the potential change in fortunes of different geographic regions under a rationalized trawl fishery. Scores for each port were developed based on four criteria: (1) the number of non-whiting trawl vessels delivering to each port associated with efficient versus inefficient size categories, (2) the percent of each port's non-whiting trawl landings associated with lower versus higher bycatch areas, (3) the level of supporting infrastructure in each port, and (4) projected allocation of quota pounds (QPs) to each port based on two initial allocation scenarios. The results highlight a few ports that appear most likely to be affected by the TIQ program. The criteria used to score each port appear to be suitable and appropriately analyzed.

Other Issues Discussed During the Meeting

Discussions during the meeting raised a number of points that were not specific to any of the focal models or analyses, but which should be given consideration as the DEIS is developed further.

- The DEIS should clearly specify the activities eligible for support under the Adaptive Management provision and the process for administration and distribution of adaptive QP.
- The IFQ alternative includes explicit provisions for catch overages, "repayment" of overages, and sanctions in the event of non-payment. No comparable provisions exist for the Co-op alternative, even though there seems no inherent reason why a co-op would be less likely to exceed its allotment of QP.
- For species that are rarely caught in trawl gear (e.g., cabezon), the cost of maintaining a system for tracking quota shares and quota pounds may well exceed the benefits. However, aggregating these lesser species into an "other fish" category may, over time, have adverse biological side-effects unless they are monitored on a species-specific basis.
- Further elaboration and analyses are needed regarding the option for geographic assignment of quota shares (QS) with a split at 40º10' N. For many stocks there is little information to define a biological basis for spatial divisions.
- The preliminary DEIS needs a more complete analysis of the effects of the alternatives on net national benefits. Such analysis will become more feasible once cost estimates associated with the alternatives become available.

The SSC notes that the preliminary DEIS was lacking several important sections and analyses, including the following:

- The regional input/output model is not yet available to evaluate the potential impacts to the regional economies of TIQ program alternatives.
- The ecosystem model is not yet available to evaluate likely impacts to the environment of TIQ program alternatives.
- The description and analysis of likely community impacts is not yet available.
- With regards to monitoring and administrative cost estimates, the SSC notes that as cost estimates are refined and developed further, care should be taken to ensure that the assumptions regarding modeled impacts are consistent among the various analyses and models.

PFMC
06/10/08

Review of Preliminary Draft Environmental Impact Statement
on Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery

SSC Economics and Groundfish Subcommittees
28-29 May 2008
Portland, Oregon

Members of the Economics and Groundfish Subcommittees of the SSC met with the Trawl Individual Quota Analytical Team (TIQAT) on 28-29 May 2008 to review materials prepared for the Council's June meeting, when the Council will choose a preliminary preferred alternative for the Trawl Rationalization Program. Materials reviewed included the Preliminary Draft Environmental Impact Statement (DEIS, Agenda Item F.6.b), supporting appendices, and other documents. The subcommittees heard presentations from Jim Seger and Merrick Burden (Council staff), Carl Lian (NWFSC), and Quinn Weninger (Department of Economics, Iowa State University).

The SSC subcommittees commend the TIQAT for making significant progress in developing documentation and supporting analyses for the TIQ program alternatives. The Council has to make a complex set of inter-related decisions to implement the TIQ program. Their task would be facilitated by documentation that clearly lays out the decisions to be taken and how those decisions relate to the objectives of the program. To this end, the SSC subcommittees offer the following suggestions regarding the organization and content of the preliminary DEIS, as examples of ways to improve the documentation.

- The Introduction section of the DEIS should include a "map" and "instructions" to indicate how to use the DEIS. Although the current preliminary DEIS includes a section on the document's organization, there is nothing that clearly indicates how the different chapters relate to each other or how the information in each chapter relates to the task of selecting among the various options for the TIQ program.
- The tables of alternatives in the preliminary DEIS (e.g., Table 2-3, "Full description of the IFQ alternatives") should include explicit linkages to other sections that describe for each alternative (a) what it is intended to achieve and (b) evaluates its effectiveness relative to the stated objectives.
- The unlabelled table on p. 118 in Chapter 4, section 4.2.2 ("Utilization of analytical methods in assessing the effects of the analytical scenarios") should include page numbers or other reference points to show where to find supporting information regarding each data collection / model component. It would also be helpful to include a flowchart or table that shows the linkages between the models and the program objectives.
- The summaries of the effects of the five analytical scenarios provide useful information on the potential impacts (e.g., changes in vessel profits and fleet efficiency), but they do not discuss the degree to which each scenario satisfies the goals and objectives of the program.

During the meeting with the TIQAT the SSC subcommittee members found it helpful to work from the table, provided by the TIQAT, entitled "Trawl Rationalization Decision Points" (Agenda Item F.6.a, Attachment 1), which listed the central decision points and summarized the Groundfish Allocation Committee's recommendations by sector. The SSC subcommittee review focused on scientific and technical details in the preliminary DEIS, particularly analyses and models pertaining to the initial allocation, the effects on fleet consolidation, and the potential for bycatch reduction.

Initial Allocation

There are various issues before the Council regarding the initial allocation of quota shares. Discussion at the meeting focused primarily on the issue of initial allocation to processors as well as harvesters. The SSC subcommittee members view this issue as primarily one of equity and social policy. The gifting of initial quota shares will provide a marketable asset to some individuals and deny it to others. Over the long run, quota shares will tend to gravitate toward the most efficient fishing operations, which will be able to outbid less efficient operations for transfer or lease of quota shares. However, the identities of long term participants in the fishery, their geographic distribution, and the amount of wealth they will be able to accumulate will to varying degrees be influenced by the initial allocation. Further, accumulation limits, grandfather provisions, and capital constraints may restrict this movement of quota shares to the most efficient operations. The adaptive management option could be developed to mitigate for short term disruptions.

Fleet Consolidation

One of the major economic benefits to be derived from a fishery rationalization program is the retirement of less efficient fishing operations and the resulting reduction in overcapitalization in the fishery. The TIQAT used a fleet consolidation model developed by Lian, Singh, and Weninger, to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program. The results from this model will also be an input into the regional economic impact model.

A standard econometric methodology (stochastic frontier analysis) was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the NWFSC. The data were collected by in-person interviews and seem to be representative of the fleet. Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced by 50% to 66% (to 40 to 60 vessels) and with cost savings in the range of $18 to $22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50 to 60 foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

There is considerable uncertainty regarding the results of the fleet consolidation model. The SSC subcommittees note that the projected size of the profit-maximizing trawl fleet may be too large, as the model does not account for specialization but instead assumes the same fixed mix of target species (whiting, DTS, non-DTS, crab, shrimp, and other) before and after rationalization. An IFQ fishery may lead to a fleet with more species specialization and thus have fewer vessels than estimated by the model. On the other hand, fleet size may be underestimated, as the model assumes no constraints on accumulation of quota shares. Also, model results were based on 2004 and 2006 harvests, when OYs were generally low. Projections of profits probably are low relative to the long term because, as stocks rebuild, future catches are likely to be higher than in 2004 and 2006, and costs are likely to be lower due to specialization in groundfish. Model results pertain to the endpoint of an ideally rationalized fleet, and are not informative about how the transition to this state will occur. Despite these uncertainties, the model results provide a general idea of the profits and fleet size that might be produced by a rationalized groundfish trawl fishery.

The fleet consolidation analysis should be accompanied by an analysis of alternative fisheries likely to be targeted by vessels displaced from the groundfish fishery that are not retired.

Also, the TIQAT should examine the maximum amount of fleet consolidation that is possible given the allocation limits in each analytical scenario. This will establish a boundary condition on the fewest number of vessels that can prosecute the fishery.

Technical Note

The stochastic frontier model included a linear term for the latitude of each vessel's home port as a mechanism to account for spatial differences in fish abundance and vessel harvesting efficiency. The coefficient for this term was not significantly different from zero. The assumption of a linear trend in fish abundance or harvesting efficiency with latitude may be distorting the results. A more flexible spatial model structure (e.g., a set of dummy variables to represent ports) would provide a better representation of spatial differences in fish abundance, which are likely to vary non-linearly with latitude, and the coefficients would provide information on potential geographic shifts in fleet operations.

Bycatch Reduction

Another major potential economic benefit to be derived from a groundfish trawl rationalization program is the ability to access groundfish stocks that currently are constrained by the bycatch of overfished rockfish species. The TIQAT conducted a trawl bycatch reduction analysis to evaluate the likely potential increase in the harvest of target non-whiting groundfish species. The analysis used observed changes in the bycatch rates of canary rockfish in a 2001-2004 EFP fishery off Washington and applied them in the NMFS/GMT trawl bycatch model to simulate harvests that could be taken under a rationalized trawl fishery. The analysis of the EFP fishery data addressed previous comments made by the SSC Economics Subcommittee in September 2007 regarding possible spurious effects due to changes in the target species in the denominator of the bycatch rate.

The EFP fishery indicated large reductions in the bycatch rates of canary rockfish when the participants in that fishery were allowed to operate under conditions similar to a rationalized fishery. It remains unclear whether these reductions are representative of what might occur under other fishing strategies or in other locations. Because the predictions from the bycatch rate reduction model serve as inputs to other analyses supporting the DEIS (e.g., the fleet consolidation model), it is important to consider a range of bycatch rate reductions that reflect these uncertainties. The TIQAT considered three scenarios – a low catch scenario based on industry input, and medium and high catch scenarios that assume 35% and 50% reductions in bycatch rate as observed in the EFP fishery during 2003-2004 (Appendix C, Table 6). It is not clear whether these three scenarios adequately bracket the range of uncertainty; however, very little quantitative information exists (other than the EFP) for projecting potential bycatch rate reductions.

To the extent that bycatch rates are influenced by the skipper of a vessel (or otherwise are caused by a vessel effect) one could expect that there will be further reductions in bycatch over time as less efficient skippers exit the fishery.

Technical Note

Additional information should be provided in Appendix C to more fully document results from the analyses and how they were derived. For example, Table 5 should include sample sizes and confidence intervals for the bycatch rate estimates. Table 6 (or the accompanying text) should include definitions of the scenarios, and should include a column for the status quo catch.

Other Models / Analyses

The SSC subcommittees also reviewed a qualitative analysis that examined the potential of different geographic regions to be made better or worse off under a rationalized trawl fishery. The analysis involved development of scores for each port based on four criteria: (1) the number of non-whiting trawl vessels delivering to each port associated with efficient versus inefficient size categories (based on results from the fleet consolidation model indicating that 50-60 foot vessels were likely to be most efficient), (2) the percent of each port's non-whiting trawl landings associated with lower versus higher bycatch areas, (3) the level of supporting infrastructure in each port, and (4) projected allocation of quota pounds to each port based on two initial allocation scenarios (catch history only versus equal allocation of buyback history). The results (Appendix C, Table 5) highlight a few ports that appear most likely to be affected by the TIQ program. The criteria used to score each port appear to be suitable and appropriately analyzed.

Other Issues Discussed During the Meeting

Discussions during the meeting raised a number of points that were not specific to any of the focal models or analyses, but which should be given consideration as the DEIS is developed further.

- It will be important to have a mandatory socio-economic data collection program to meet the reporting requirements of an ITQ program and to determine the degree to which the program's goals are being met.
- The preliminary DEIS and supporting analyses start with the assumption that trip limits would be replaced by individual quotas but that other current management measures would remain in place. The Rockfish Conservation Areas (RCA) will constrain the ability of quota holders to fully capture the benefits of the IFQ system. The Council may wish to reconsider the need for the RCA once the effects of rationalization become more apparent.
- The DEIS should clearly specify the activities eligible for support under the Adaptive Management provision and the process for administration and distribution of adaptive QP.
- The IFQ alternative includes explicit provisions for catch overages, "repayment" of overages, and sanctions in the event of non-payment. No comparable provisions exist for the Coop alternative, even though there seems no inherent reason why a coop would be less likely to exceed its allotment of QP.
- For species that are rarely caught in trawl gear (e.g., cabezon), the cost of maintaining a system for tracking quota shares and quota pounds may well exceed the benefits. However, aggregating these lesser species into an "other fish" category may, over time, have adverse biological side-effects unless they are monitored on a species-specific basis.

- The National Standards Guidelines for Annual Catch Limits accountability measures may mandate provisions that will impact the program, both in terms of defining species complexes and carryover of catch overages.
- Further design details and analyses are needed concerning QS that sunsets and is then sold at auction.
- Further elaboration and analyses are needed regarding the option for geographic assignment of QS with a split at 40º10' N. For many stocks there is little information to define a biological basis for spatial divisions.
- The preliminary DEIS needs a more complete analysis of the effects of the alternatives on net national benefits. Such analysis will become more feasible once cost estimates associated with the alternatives become available
- The preliminary DEIS has no analysis of the effects on consumers with regard to product availability and prices.
- The preliminary DEIS does not address how the Council will handle spill-over effects on other sectors from overages by the trawl sector, and vice versa.
- The preliminary DEIS only partially addresses mechanisms for handling QS of an overfished species that becomes rebuilt, or the transition (if any) for QS of species that become assessed as overfished.
- The preliminary DEIS does not address the spill-over of vessels displaced by consolidation and the alternative fisheries that are likely to be affected.
- If under an IFQ system it is advantageous to be in a cooperative, then one would expect this formation of organization to develop. It is unclear why an IFQ program would need to require the formation of coops.
- The TIQ program currently includes no provisions that prohibit individuals from retiring their quota shares. QS that is held but not used seems counter to the goal of full use of potential harvest. However, if the public places higher value on fish existence than on fish products, not using QS could result in increased net national benefits.

The SSC notes that the preliminary DEIS was lacking several important sections and analyses, including the following:

- The regional input/output model is not yet available to evaluate the potential impacts to the regional economies of TIQ program alternatives.
- Monitoring, data collection and management, and enforcement costs are not yet available. The desirability of some of the proposed alternatives may change considerably, once their costs are known.
- The ecosystem model is not yet available to evaluate likely impacts to the environment of TIQ program alternatives.
- The description and analysis of likely community impacts is not yet available.

Agenda Item F.6.d
TIQC Report
June 2008

Groundfish Trawl Individual Quota Committee

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220
503-820-2280
May 15-16, 2008

Groundfish Trawl Individual Quota Committee (TIQC) Recommendations to the Council

After attending the May 13-15 Groundfish Allocation Committee (GAC) meeting, the Groundfish Trawl Individual Quota Committee (TIQC) met May 15-16, developed the following recommendations for the Pacific Fishery Management Council (Council).

Species Coverage and Secondary Management Tools
The following recommendation for the shoreside and at-sea sectors were passed on a 10-3 vote.

Shoreside: The TIQC recommended that

- **certain species rarely taken in the groundfish trawl fishery be managed without Quota Shares (QS),**
- **projected catches for those species be deducted from the annual Optimum Yield (OY),**
- **those species' catch amounts be monitored, and**
- **when a catch "trigger" amount or percent of OY is reached then a management action is implemented immediately or for future years.**

To ensure conservation objectives are met, the trigger amount might be set at a level lower than that which would create a conservation concern. The management action that occurs when the trigger amount is reached would be determined when the trigger is reached, based on conditions at the time. Possible actions could include switching those species to QS management after reaching the trigger catch amount. Current state regulations should be evaluated to ensure that they would contain the potential expansion of harvest on non-QS species that might occur if trawl vessels switched to the use of non-trawl gear to take their QS species.

Species recommended for trigger mechanism management in the shoreside fishery are listed in the table below:

SHORESIDE FISHERY NON-COVERAGE	
Longspine S 34°27'	California Scorpionfish
Minor Nearshore Rockfish N	Cabezon
Minor Nearshore Rockfish S	Kelp Greenling
Black Rockfish (WA)	Shortbelly
Black Rockfish (OR-CA)	Other Rockfish

At-Sea: The TIQC recommended two options for Council consideration: 1) status quo or 2) a trigger mechanism for certain species. The suggested management action at the trigger point could be a bycatch cap that is distributed to the co-ops. At-sea sector species that are recommended for either the trigger mechanism or status quo management are listed in the table below:

AT-SEA FISHERY COVERAGE	
STATUS QUO (and existing co-op alternative)	PROPOSAL FOR COVERAGE
WIDOW	SLOPE ROCK
DARKBLOTCHED	SHELF ROCK
CANARY	CANARY
	DARKBLOTCHED
	LINGCOD
	POP
	SABLEFISH
	WIDOW
	YELLOWTAIL

Rationale and discussion: Bycatch reduction would remain the goal of this "trigger mechanism" management, even for species with no conservation concern. Conservation goals could be addressed if the trigger mechanism is set at a point that would ensure a precautionary approach. Under this mechanism, some species in the Allowable Biological Catch (ABC)/OY table would not be managed with QS. There should be a process for placing a new species under QS management, and that process would be the same whether a species is first managed by the trigger mechanism and later placed under QS, or a species is first managed as part of a complex and later has its own ABC/OY and later place under QS.

Unused amounts would not carry over between years. No rollover provision between sectors would be available, as it would be too difficult to administer.

Two conflicting concerns were expressed about having QS for species that are rarely caught: on one hand, accumulation limits would have to be very high, but on the other hand, a few individuals should not be allowed to "corner" the QS for a species. Cabezon is an example where an individual could control most of the QS for that species and therefore control that aspect of the fishery. Cabezon has such low catch numbers in the trawl fishery that QS don't make sense, and this species is one that should, instead, be dealt with through the trigger mechanism management provision.

Shortbelly serves as another good example of a species that could be managed with the trigger mechanism – it has no market, a very large OY, and is mostly taken by the trawl fishery. QS would work, but really are not needed and could needlessly burden the quota tracking and administration system, whereas the trigger mechanism would ensure full catch accountability without the complexity of buying, selling and trading QS.

If the Council does not include some nearshore species under the IFQ program because it anticipates that state regulations will sufficiently control groundfish trawl harvest, that reliance on state regulations should be memorialized in the Council action. Future changes in state regulations would have to be evaluated to ensure that they continue to achieve the Council intent. If they do not, then Federal action could be necessary.

Intersector Allocation: TIQC recommends other shelf rockfish have QS and undergo the intersector allocation process. Should the intersector allocation process prove difficult for this species, the fall back process would be the biennial specifications process for the other shelf rockfish complex.

Rationale: The OY for shelf rockfish north and south is far greater than the amount the trawl fishery harvests, and there are no other significant catches for this complex in other fisheries. Therefore, using QS for this species complex is appropriate and would not limit other sectors.

Accumulation Limits

The TIQC recommended the establishment of accumulation limits. The TIQC also identified a correction needed in the accumulation limit table for Option 2 for the shoreside whiting sector.[1] The TIQC recommended modifying the shoreside whiting sector vessel caps so that they are all 50% above the control caps (change the 7.5%, 10%, and 12% vessel caps to 15%, 22.5% and 37.55, for Options 1, 2 and 3 respectively.

Rationale and Comments: The purpose of accumulation limits is to ensure the QS are held in a large number of hands and that no one is accumulating excessive shares.

The shoreside control cap could logically be greater than the vessel cap to accommodate people who have more than one vessel. Or perhaps you would want to force a company to run two boats, rather than putting all their QS on one vessel. However, the TIQC recommended increasing the vessel caps to levels above the control caps to facilitate consolidation.

Without accumulation limits, depending on which species is looked at, the number of boats that could accumulate the QS for a single could be as low as one or two boats. Those select vessels could end up controlling the fishery by accumulating a majority of the QS for a single species. On the flip side, there may be only a few boats that target certain species and accumulating a large portion of the QS for a species would reflect a current fishing strategy some vessels use. Accumulation limits set too low would hurt vessels using that fishing strategy.

The TIQC was concerned about allowing loopholes to occur in the accumulation limits, such that the own or control cap could be exceeded. The intent should be to not allow loopholes, discourage cheating, and apply meaningful penalties including the loss of QS.

The Table 2-4 aggregate own or control caps for whiting would span both co-operative and IFQ systems. Now that the nonwhiting and whiting shoreside sectors are being combined into a single sector, own or control accumulation limits for certain species, such as widow rockfish, may need to be re-evaluated. Additionally, the situation where one vessel is highly dependent on a single species, such as arrowtooth, should be considered and addressed.

Vessel Caps

The TIQC recommended the vessel caps or vessel use limit issue should be a priority for the Council at the June meeting.

[1] The vessel cap was listed as 11.3% and should have been listed as 10%.

The concern with permit caps is stacking multi permits on one vessel. "Vessel caps" may be difficult to implement because vessels are not allocated QS so would not have an amount of QS at which they would be grandfathered in. However, a grandfather clause could apply to a permit, which does receive allocations. The administrative complexity increases, if we specify it as a vessel cap. One consideration could be to not have more than one permit on a vessel, and then implement a permit cap. If there is no grandfather clause for a vessel, then this issue goes away because the overage aspect would not have to be monitored.

Grandfather Clause

Shoreside: The TIQC recommended against a grandfather clause and that the shoreside sector accumulation limit be set to the highest level of consolidation that existed as of Jan 1, 2004. Under this approach, only entities acquiring additional permits after January 1, 2004 could receive QS in excess of the accumulation limits. An analysis will show what the accumulation limits will be and how they line up against goals and objectives.

If the Council doesn't endorse this recommendation, the TIQC recommended that entities over the accumulation limit be given time to divest themselves of their QS. The TIQC also recommended that the Council consider allowing 2 years to divest, after the end of the first year freeze on QS trading.

Mothership: The mothership (MS) sector representatives on the TIQC also supported this concept for their sector, but with the option of using a more recent date: January 1, 2008.

Rationale: Speculators should not be rewarded, and using the November 6, 2003 control date achieves that purpose. The TIQC has recommended that the date be moved slightly (to January 1, 2004) to coincide with the start of the fishing year. This is similar to what was done for the QS and co-op qualifying periods (which all end December 31, 2003). A control date applicable to permit accumulation is needed to prevent a race to acquire catch history. For non-overfished species, an own or control limit could be established based on levels of consolidation as of that date. In the shoreside sector, this would serve as the aggregate groundfish and the species accumulation limits.

Grandfather clauses should expire. Other fisheries with grandfather clauses allow them to expire because the administrative costs for keeping track of these are high and because they create a privileged class of fishermen. It there is an accumulation cap it should be the highest amount for each species prior to or at the time of a particular date and all participants would be able to fish up to that cap so that a privileged class is not created.

Permit length endorsement

The TIQC recommended the length endorsement be dropped.

Rationale: After implementation of the QS program there will no longer be a need for a length endorsement on trawl permits to control the growth of capacity. Such an endorsement would still be needed for any permit that has a fixed gear endorsement.

Carryover provision

The TICQ flagged this issue for consideration, but did not recommend a change.

The TIQC identified several solutions for situations in which an individual holds QP at the end of a year that are not associated with a vessel account and therefore would not be slated for the

10 percent carryover. That individual QS holder could contract with a vessel or lease or sell the QP to ensure that 10 percent carried over for use in the following year.

Overage Violation

The TIQC recognizes the issue, does not have a ready solution, but recommends the Council consider some sort of an appeals process when an individual has an overage that is difficult to cover because of limited QS availability.

Two aspects of QS overage should be addressed. One is the penalty applied for a violation in a fishery, which must be assessed and dealt with in the court system before fishing again. The second is the obligation to cover all catch with QS, which can act like a penalty depending on the time frame for obtaining and applying QS to an overage, and whether or not there is a carryover provision. On the second point, should there be forgiveness after some amount of time, if QS is never acquired or "not available"? For instance, not available could be defined as QS cannot be acquired, QS is too expensive, or no one is selling QS for that particular species. An appeal process to look at why those QS have not been acquired in a certain amount of time, and to determine whether forgiveness should occur, could be one solution to this issue.

Another aspect of the penalty for overages issue is which fisheries should vessels with overages in the trawl fishery be able to fish in? Could vessels that are tied up and unable to fish in other fisheries or fish for other QS species make enough money to buy their way out of the QS overage? And if one vessel has a disaster tow and buys up all the QS for a rare species, is the rest of the fleet suffer from the low availability of QS?

Allocation of Overfished Bycatch Species

The TIQC supports this Groundfish Allocation Committee (GAC) recommendation of taking a look at area at a finer resolution.

California Halibut

California halibut trawl is legal groundfish trawl gear. The TIQC discussed whether or not a vessel that had a QS overage should be allowed to continue to fish for California halibut (discarding groundfish) but did not have a recommendation on this issue.

First Year Trading Freeze

The TIQC supports the concept of a one year moratorium on the trading of QS at the start of the QS Program (quota pounds would not be subject to the moratorium).

Rationale: TIQC members noted that not having such a moratorium in the first year of the program was a major regret of those in the New Zealand fishery. QP trading in the first year would begin to provide participants a sense of the value that QS would likely represent.

Pacific Halibut Individual Bycatch Quota (IBQ)

The TIQC recommends the Council staff gather the following information:

- Is trawl caught halibut a conservation issue?
- Is trawl caught halibut an allocation issue?
- Ask the International Pacific Halibut Commission (IPHC) about
    - How Constant Exploitation Yield (CEY) is determined?
    - How is the catch rate currently determined?

  - What are the factors that determine mortality, and do they include sublegal halibut? If so, should there be QS for sublegal halibut?
  - How are these estimates generated for west coast areas, which data is being used, and what does it show?
  - What did they do in Area 2B to get the mortality down?
- Is the trawl share of Pacific halibut based on abundance, mortality, or catch?
- Submit a request to Northwest Fishery Science Center (NWFSC) for the halibut catch information in the bottom trawl fishery (we have all the other sectors information currently).
- Consider whether different bycatch rates in the Vancouver and Columbia management areas would produce different IBQ allocations. Would this be an issue for those who fish near that dividing line?
- From what pool would the Halibut IBQ be allocated? In other words, we don't have an ABC/OY for this species so what would the starting amount be for IBQ shares? Should that amount be determined through the Intersector Allocation process? Or could the assumed catch amount in the trawl fishery be the starting point?
- Would recent catch history be used to reflect the establishment of Rockfish Conservation Areas (RCA), or would it be better to look at a longer range of years because the abundance of halibut varied?

Rationale: Halibut IBQ could provide a way to proactively and effectively reduce bycatch of halibut in the trawl fishery. This may be particularly important if the halibut catch equilibrium yield declines dramatically, as some expect. Options that would require trawlers to reduce halibut bycatch from current levels should at least be looked at.

Mothership Co-op Catcher Vessel Catch History Allocation

The TIQC reviewed some new data that was provided after the GAC meeting based on the GAC recommendation that a 1994-2003 allocation period be considered in addition to the 1997-2004 allocation period. It was noted that for the longer time period the option should be "drop 2 years", while the qualification and the catch history years should match.

Area Management

The TIQC did not make a specific recommendation pertaining to the Area Management options.

<u>Rationale and Discussion:</u> It is not clear whether additional management lines would serve the purpose of distributing effort and landings along the coast or whether the purpose is to prevent localized depletion. Restrictions on removal areas should be linked to the range of the stock units, and to link QS to a more restrictive area does not allow flexibility to harvesters when and if the species move around within their range. Such a restriction could force fishermen to stay within an area where localized depletion has occurred. To require landing occur in an area doesn't acknowledge areas of high bycatch (which could change through time) and closed areas. Additional management lines cannot be draw arbitrarily. If additional lines are used for conservation purposes, consideration should be given to sub-stocks, the localized depletion issue, and delineating areas of low bycatch where more fishing could be encouraged. If additional management lines are intended to tie landings to areas of the coast and to protect communities, a better way to achieve that objective may be the Adaptive Management provision. The TIQC noted that there is already a program provision and mechanism developed in the trawl

rationalization Environmental Impact Statement for any future needed management lines. However; if that provision is going to be used, the Council should put people on notice they may be restricted in the future where they can fish their QS.

PFMC
05/27/08

Pacific Catch Fresh Fish Grill

Pacific Catch, Inc.
1200 7th Street Suite 100
San Francisco, Ca 94107
415-522-5171 x101

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MAR 20 2008
PFMC

March 20, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384
Fax 503-820-2299

Dear Chairman Hansen:

As purchasers and sellers of West Coast seafood products, we have a great interest in protecting and promoting a vibrant and sustainable fishing and seafood processing industry. Combined, Oregon restaurants and grocers represent thousands of jobs and a huge sales market for West Coast fish and seafood products.

Along the West Coast, we are blessed with some of the freshest and best seafood products found anywhere. Getting these products from the Pacific Ocean to the grocery carts and restaurant plates of our customers requires a healthy fishing industry, a healthy and innovative processing sector and an efficient distribution and transportation network. All are critical to the entire industry's success.

As you consider adopting new rules that govern how fish are caught and processed along the West Coast, we urge you to adopt rules that include and are fair to both fishermen and processors. As we understand it, the initial quota allocations will be made according to historical industry contributions and there can be no doubt of the equally important historic roles played by both the fishing and processing sectors in creating a sustainable industry. A quota program that fails to recognize the critical role of processors in creating markets for seafood products could have an adverse impact on consumers. In short, fishermen need processors to be healthy; processors need fishermen healthy; and consumers need them both to get the products they desire.

We are proud of our relationships with fishermen, processors and everyone in between who helps us deliver fine seafood products to our customers and share Oregon's bounty with the world. I support new rules that will make this industry stronger and urge you to consider the impact new rules will have on every aspect of this seafood industry sectors.

Sincerely,

Aaron Noveshen

50 copies of the letters like that from “Pacific Catch Fresh Fish Grill” were received from restaurants, grocery chains, seafood wholesalers, and processors.

California	5
Oregon	9
Washington	16
Idaho	1
Nevada	7
Other States	4
Canada	2
Undetermined	6

The following comment was received from 247 persons via e-mail.

Subject: Dear Pacific Fisheries Management Council
From: Kirsten.Forsberg@xr400.sterlink.net
Date: Fri, 28 Mar 2008 11:38:55 -0700
To: pfmc.comments@noaa.gov, info@coastaljobs.org

April 2008

Dear Pacific Fisheries Management Council:

A healthy and growing West Coast seafood industry is important not only for our regional economy, but to the many industries that support it and for those who depend on it for quality consumer products. That is why I am writing today.

As you consider new rules to manage and govern West Coast fisheries, please remember the entire seafood industry – from the fishermen, to the dock support, processor, sales and distribution networks and grocery and restaurant consumers. Specifically, I urge you to support a quota allocation system that provides a fair initial allocation to both fishing vessel owners and processors. A fair quota allocation will mean a stronger seafood industry for everyone; an unfair allocation will threaten industry stability and growth.

Thank you for your thoughtful consideration of my point of view and your commitment to policies that will protect and grow the seafood industry.

Sincerely,
Kirsten Forsberg

Additional Comments:

DATE

May 5, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

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MAY 0 8 2008
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Dear Chairman Hansen and members of the Pacific Fishery Management Council,

I am a fish buyer/processor from … and I am writing to ask you to oppose initial allocation of quota to processors in the IFQ program for the west coast trawl fleet. If quota is allocated to processors based on processing history, it will have a disastrous effect on small processors/buyers up and down the coast.

The way the alternatives are currently structured only a handful of the very largest processors would be eligible to receive any allocation. Such an allocation system will enable that small number of large processors to become even larger, and will make it easier for them to continue to squeeze out small processors/buyers. Large processors will become the beneficiaries of an even larger market advantage eliminating the potential for small buyers/processors to partner with fishermen on innovative marketing arrangements.

There is absolutely no justification for a giveaway of public trust resources to a handful of very large processing companies that will create such devastating impacts for other processors/buyers who are not entitled to receive a piece of the allocation pie. Please oppose initial allocation of quota to processors.

Sincerely,

Robert J. & Nancy C. Phelps
171 Ivy Lane
Port Angeles, WA 98362

Robt & Nancy Phelps

P.S. We are customers at the small & large stores on the Olympic Peninsula and we like buying fish from ~~[illegible]~~ not a large fish plant.

Comment Submitted By Dave Fraser, May, 13 2008

Groundfish Rationalization Catch History Years

The choice of catch history years should be consistent between sectors, whether or not the choice of programs is consistent.

The choice of program type (either IFQ or Coop) should not be influenced by differences in the sets of catch history years between the two program alternatives, nor should the catch history years be determined by the choice of program.

As presently structured, the IFQ alternatives use a longer time series than the Coop alternatives. (1994 to 2003 versus 1997 to 2003). Additionally, some members of the MS sector have advocated using 1998 to 2004 for the MS sector only.

Using different years for different sectors, does not result in "fair and equitable distribution of access privileges in the fishery" among similarly situated persons, as illustrated by the following table.

Catch History Years by Sector - with hypothetical vessel histories.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Shoreside IFQ											~~2004~~	~~2005~~	~~2006~~	~~2007~~
MS Coops				???							???	~~2005~~	~~2006~~	~~2007~~
Vessel 1	MS	MS	MS	MS?	MS	SS	SS	SS	SS	SS	~~SS~~	~~SS~~	~~SS~~	~~SS~~
Vessel 2	SS	SS	SS	SS	SS	MS	MS	MS	MS	MS	~~MS?~~	~~MS~~	~~MS~~	~~MS~~
Vessel 3	SS	SS	SS	SS	SS	MS	MS	MS	MS	-	-	-	-	-

Hypothetical Vessels 1 & 2 each participated in only one sector per year, however each participated every year in either the MS or the SS sector of the whiting fishery. Between 1994 and 2003 both Vessels 1 & 2 participated for 5 years in the MS sector, and 5 years in the SS sector (assume these hypothetical vessels had typical and consistent landings.)

If IFQs are chosen for the Shoreside sector using 1994 to 2003, and Coops are chosen for the MS sector using 1998 to 2004, the allocations to the two vessels would differ radically.

Vessel 1 would get credit for 1 of 7 qualifying years for the MS sector, while Vessel 2 gets credit for 6 out of 7 years.

Vessel 1 would get credit for 5 of 5 qualifying years for the SS sector, and Vessel 2 also gets credit for 5 out of 5 years.

The result is that each vessel gets 50% of a full Shoreside history, but Vessel 1 only gets 14% of a full MS history, while Vessel 2 gets 86%. Vessel 2 gets a windfall as a result of using more recent years for the MS sector relative to the Shoreside sector, while Vessel 1 gets penalized.

1994 through 1997 should be included for all sectors or none.

The desire to include catch history that is more than a decade old should be balanced against recognizing "present participation" and current "dependence" on the fishery."

We don't oppose including history as far back as 1994, though there is little precedent for reaching that far back. However, it is necessary to recognize that "control dates" don't have any regulatory weight, nor are they mentioned in the MSA. What the MSA does say, is that limited access programs must "take into account…" (*among other things*) "present participation…and dependence on the fishery."

A vessel that has participated in, and depended on, the shoreside whiting fishery for the last 10 years, should not lose the last 4 years of that " present participation" if a vessel that hasn't depended on the fishery for 10 years is to get credit for history that older than that.

Subject:
fishing Steve Aarvik
From:
oneme5she@comcast.net
Date:
Fri, 02 May 2008 23:41:39 +0000
To:
John.DeVore@noaa.gov (John DeVore)
To:
John.DeVore@noaa.gov (John DeVore)

To Whom It May Concern;

My name is Steve Aarvik the owner of the Windjammer. I have been the owner/operator for these last 20 plus years. My family and others have been through the changes of the fishing industry. Unfortunately, most of them have been to the detriment to my family and the industry we have nurtured and preserved for these many years. The lively hood that is now being stripped from the people that have been so committed to for all of these years. When my family started in the fishing industry we began fishing Rock fish. That was taken away from us, given to other fisherman, Native Americans as to appease other cultures for the negative occurrences from years past. These participants didn’t have the years of experience and years of sweat and tears, the building a family dedicated to the industry since the early 1950’s. Going through these many changes, paying the taxes, the increase in licensing costs changing the permit prices. This buy back program of the trawling fishing boats, allowin g them to sell off and come back into the industry in another boat, other licensing stealing from those of us who have dedicated our lives and families to this industry. Unfortunately, this quick but not permanent fix for some, the overall impact who like my family is having to pay the consequences of this program,. The diving up the catch, among the many fishing vessels, allowing some participants who may have never fished now are getting in the coat tails of those of us who have worked so hard, paying for the appropriate licensing, being a Native to the fishing industry for so many years.

The Windjammer was built in Seattle, has paid for the licensing, federal and state taxes for all of these years. My family started this at a time when not many were involved or willing to work so hard to supply food for their families to support the state in ways by paying our taxes and fees. There needs to be consideration for those of us who are not in and never have been in the “Buy Back” programs. This industry has broken many a fisherman and families, the lives have been lost, but those of us who were and still are dedicated still merge through the changes and continue to fish to support our families should have some kind of protection, a grandfather clause to provide for us in order to keep fishing and managing our business which enables us to support our families. In addition, with the changes over and over again, the recession that has not given us only 12 cents a pound for fish from 1.10 a pound, we still continue to bring in the demand of the people, providing the fish , for the tables of many. How can this continue with the increases in taxes, the permits, the cost of fuel how in every direction our lively hood and dedication means nothing, we are still keep bringing home the fish to feed the multitudes the starving as we are becoming second in many ways, where is the safety net, the protection that will keep us afloat, give the recognition to the hard work in this industry. Who will take over this for the industry?

When the AFA Endorsement was signed by Patty Murray, and Ted Stevens who guaranteed us precautions, to protect us from this type of situation happening again. The false promises, the inability or unwillingness to return our calls address our concerns when now we are going through the raping and pillaging of the industry that my family and others have worked so hard to appreciate, nurture and develop into food on the plate of the families all over the globe.

With the ever changing requirements, new licenses and a third party deciding who can fish, how much a vessel is allowed to fish for regardless of their dedication to the industry, such as my family and others who have been fisherman for these many years. The powers that make these decisions do not take into consideration those of us who are Native to the industry, who started fishing years back, through the changes and regulations, the taxes the federal requirements. The thousands of dollars we spend with insuring the safety and well being of our crew, the purchasing of supplies to provide for our crew. The fuel expenditures that pay taxes, and keep other industries surviving. There needs to be some type of monitoring or accountability to those who participate in the “Buy Back” who may be “double dipping” after completion of the “Buy Back” . They then may purchase other licenses and vessels which allow them to pursue the same fishing opportunities. How can this be permitted, whe n the Processors as well as the other industry participants who manage to sell and then buy other licenses and start back where they left off, After they sell their interests and then are allowed to take a second piece of this smaller pie that so many have to share, those of us like my family have been involved and doing the back breaking, yet honest way of doing business, for all these years. This create a larger issue, the monopolizing the industry and creating an Anti-trust, of this business that so many have built to provide for our families, and put the food on the table of many, yet at times struggling to survive or stay in the lively hood of my family for these many years.

--

John Coon, Deputy Director

Pacific Fishery Management Council

7700 NE Ambassador Place, Suite 101

Portland, OR 97220-1384

Phone: 503-820-2280; Fax: 503-820-2299

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MAY 12 2008
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Mr. David Ortmann
Pacific Fishery Management Council
7700 NE Ambassador Place
Suite 200
Portland, OR 97220-1384

May 8, 2008

Dear Mr. Ortmann,

Enclosed is an Op-Ed that ran in yesterday's *Sacramento Bee* that may be of interest to you.

As you may know, many stakeholders met with members of the California Legislature on Monday to discuss how appropriately designed catch share programs hold much promise for restoring coastal jobs, communities and the environment.

We look forward to the important vote at the Council on the Pacific groundfish IFQ.

Sincerely,

Johanna Thomas

Johanna Thomas
Director of Fisheries Projects

123 Mission Street, 28th Floor · San Francisco, CA 94105 · Tel 415 293 6050 · Fax 415 293 6051 · www.environmentaldefense.org
National headquarters: New York   Austin · Boston · Boulder · Los Angeles · Raleigh · Sacramento · Washington   *Project offices:* Beijing, China · Bentonville, AR

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The Sacramento Bee

Editorial

Tuesday, May 6th, 2008

'Catch share' process can help fisheries

By Johanna Thomas

If you've bought wild salmon recently you undoubtedly got hit with some serious sticker shock. Retail prices have nearly doubled from last year because the fish have largely disappeared off the California coast. If you're a fisherman, the shock is worse: Salmon is off limits to recreational and commercial harvests, leaving fishermen in a state of crisis. Unfortunately, the problems aren't just limited to salmon. Other fisheries such as Pacific rockfish, marketed as "red snapper," are also in trouble.

West Coast landings of rockfish or groundfish plunged by 70 percent during the last two decades, from an average of 74,000 tons in the 1980s to 22,214 tons in 2007. Revenues from the groundfish fell by more than half from 1997 to 2007, from $47.3 million to $22.2 million. In 2000, the U.S. Department of Commerce declared the fishery a disaster, due to major declines in nine of 82 species of groundfish. Today, the Pacific Fishery Management Council, which governs West Coast fishing, lists seven species of rockfish as overfished.

The problem is not the fishermen. Fishermen have done everything that fishery managers have asked them to do. With fisheries continuing to fail, perhaps now is the time to reconsider the direction we've been taking with fishery management.

On June 8, the Pacific Fishery Management Council, one of eight regional councils governing fishing in U.S. waters, will meet in California on the future of Pacific groundfish. The council has an opportunity to incorporate management measures for harvesting Pacific groundfish that have worked well to recover fisheries in other regions. Opportunities to make fishing more profitable and sustainable also will be considered during a hearing today of the Joint Legislative Committee on Fisheries and Aquaculture in the Legislature's annual Fisheries Forum.

Historically, fishery management councils have responded to crisis through measures such as shorter fishing seasons and smaller daily limits. Instead of reducing the catch as intended, such regulations set up a "race for fish." The consequence has been dangerous fishing conditions, larger investments in boats and gear, a market glut and associated environmental damage. There are substantially better management techniques.

In several places in the United States and globally, fishermen have been given the right conservation incentives and accountability to fish more efficiently, conserve the resource and bring in better quality fish at a higher price. Similar to the current plight of U.S. Pacific groundfish, British Columbia was experiencing steep declines in groundfish landings in the mid-1990s. As a result, fishermen were put under increased regulations, raced to bring in as many fish as possible and received a lower price for their fish when the market was flooded.

In 1997, British Columbia launched a catch share program for their groundfish fleet. This program gave each boat a guaranteed "share" of the allowable rockfish catch for the year based on a combination of each vessel's catch history and size. The guarantee allowed fishermen to fish at their own pace. Since they could fish when prices were best, they could make a higher profit on fewer fish. In 1996, 29,000 tons of groundfish were landed in British Columbia with revenues worth $21 million. In 2000, 26,000 tons of groundfish – 10 percent less than in 1996 – yielded more than a 60 percent increase in revenue, $34 million. And the program required a scientific observer to be aboard the boat, which provided better data about the health of the fishery and served as a basis for better fishery management decisions.

A similar catch share program is up for vote by the Pacific Fishery Management Council in June. It is critical that the council get this one right. With the correct safeguards in place and tools for fishermen, Pacific groundfish can experience the same comeback as was experienced in British Columbia. Much depends on what opportunities and flexibility fishermen have to make the right choices about how much, and when, to fish.

###

Public Comment GAC May 13, 2008 William Daspit

Thank you, Mr. Chairman and committee members for this opportunity to speak to you once again.

You have been charged by the Council to develop recommendations for sector allocations that seem to be necessary due to the trawl rationalization effort. You have done an admirable job given the charge you received from the Council. In addition to the recommendations you have made so far you could also include no sector allocations as a recommendation. Recommending no sector allocations is appropriate since the Council needs to have all viable options before them in order to make the best possible decision. Granted, no sector allocations would require allocations to each individual permit. Recommending no sector allocations would also require that the trawl rationalization effort be expanded to encompass non-trawl and open-access fishermen.

Sector allocations are undesirable and very detrimental to a sustainable fishery management regime. Sector allocations will prevent trawl and non-trawl fishermen from exchanging dollars for annual allocations. Giving each fisherman the opportunity to buy and sell quota share amongst the largest number of fishermen is desirable and will move the fishery toward sustainability. Allowing non-trawl fishermen to buy annual allocations from trawl fishermen makes good sense, especially in a fishery constrained by the very small allowable catches for the seven rebuilding species. Sector allocations are not desirable since gear-types other than trawl may be a better way to catch fish, given bycatch, habitat, and sustainability considerations. A true economic marketplace would allow trawl and non-trawl fishermen to buy and sell their annual allocations amongst each other. A true economic marketplace would allow each fisherman to market his catch to the highest bidder. A true economic marketplace would allow each fisherman to lease his annual allocation without being required to permanently sell it. A true economic marketplace would allow each fisherman to fish sustainably and still have a successful fishing business.

Sector allocations would guarantee the trawl fleet approximately 85% of all future catches. This is not desirable. What is desirable is that each permit holder uses the appropriate gear-type to catch his allocation. Allowing each fisherman the opportunity to increase his share in each subsequent fishing year is desirable and will promote sustainable fishing practices. Gaining additional quota share through sustainable fishing practices is most desirable. Sector allocations are also undesirable because they would compartmentalize the fishery. The FCMA requires that each species must be managed holistically throughout its range. Sector allocations would create many small management regimes competing with one another. A single comprehensive management regime will be the most effective in achieving sustainable fishing. A single comprehensive management regime will allow the largest economic marketplace for trading annual allocations. A single comprehensive management regime will allow the Council and NMFS to conduct groundfish management with the least expense. A single comprehensive management regime will allow all fishermen to move to where the fish are available. A single comprehensive management regime will allow the Council and NMFS to focus their efforts on other more important groundfish issues, including improving data collection for improved stock assessments.

Sector allocations would create ever more complexity for a groundfish fishery that is already managed with much more complexity than is necessary. No sector allocations coupled with individual allocations to each limited-entry permit, including open-access, would produce a management regime with the least complexity. Minimizing complexity is good. Minimizing complexity means minimizing costs. Sector allocations would create more complexity because there could be as many as six commercial segments of the fishery to manage. Each of these sectors will require some management. Allocating directly to each permit is the least complex method to manage this fishery. Allocating to each permit eliminates any middlemen such as co-ops would introduce. Co-ops, as they have been described, will not move the fishery toward sustainability. Individual responsibility at the permit level is the only allocation method that will produce sustainable management.

The OSHUA fishery management plan includes no sector allocations. The OSHUA plan also includes annual allocations to each permit, including open-access. This plan is the least complex and the least expensive. The OSHUA plan is holistic and comprehensive, whereas the Council options, including sector allocations, are piece-meal solutions. The most effective and fair management plan is a comprehensive plan that includes all fishermen. Each fisherman must be given an individual allocation if sustainability is to be achieved. I ask that you re-consider your decision to ignore the OSHUA plan, which is a viable alternative. NEPA and FCMA law requires that all viable alternatives be considered.

Public Comment GAC May 14, 2008 William Daspit

Thank you, Mr. Chairman and members of the committee for this opportunity to speak to you once again.

The Trawl IQ committee has done an admirable job of developing options for a trawl-only IFQ management plan. The committee has developed options that are focused primarily on the economic interests of those holding large amounts of catch history. The committee has developed options that are not focused on sustainable management. The committee has proposed using catch histories that would give large quota shares to those with catch histories earlier than the last five years. Using catch histories earlier than the last five years goes against the FCMA's provision that IFQ's must be based on current participation. ITQs in general are designed to privatize a public resource and the Trawl IQ committee's options reflect this. Privatizing a public resource has become popular in recent years based on the belief that only private ownership of a public resource will produce sustainable management. On the contrary, privatizing a public resource is actually a method of implementing no management at all. The primary purpose of fisheries management is allocating among the many participants and that is the primary reason for which the Councils were created. Management must include adaptive management, but the TIQ committee options being proposed do not include any adaptive management measures. The options are such that once the trading begins the Pacific Council would cease to have any influence.

There is a better way to manage and to allocate a public resource. There is a better way to ensure that each fisherman receives a fair share of the available catch based on current participation. Including all commercial fishermen in the IFQ plan is the first step in developing options that are fair. Including all sectors as one single sector is the second step in producing a management plan that is fair to all fishermen. Sector allocations are the direct result of developing a trawl-only IFQ plan. A comprehensive IFQ plan does not require sector allocations because all available catch is allocated to each individual permit. The third step is to allocate to each permit annually, which obviates the need to privatize the public resource. Allocating a percentage of the available catch to each permit annually is a very simple task given the available technology. Granted, exploitation of some public resources has been improved as a result of transferable IQs, but privatization is not necessary nor useful for Pacific Council groundfish management. Privatizing the groundfish fishery will continue the unsustainable fishing practices of the last 26 years. Privatizing this fishery will only produce wealth at the expense of sustainable management. Producing wealth is good, but only producing wealth as a result of a sustainable fishery is what is desirable. The whole purpose of sustainable management is to produce wealth for fishermen, processors, and communities.

The OSHUA plan does not privatize the fishery. The OSHUA plan does this by allocating catch to each commercial permit annually. The OSHUA plan will produce sustainable, adaptive management because annual allocations of rebuilding species are tied to the allocations of target species on a pro-rata basis. The OSHUA plan is a fair plan because all commercial fishermen will receive an allocation based on their most recent five-year catch history. The OSHUA plan is a fair plan because there are no sector allocations, allowing the largest marketplace for trading. The OSHUA plan is a fair plan because it provides for the seamless transition from rebuilding status to target status. I ask that you re-consider your decision regarding the OSHUA plan by comparing each feature of the OSHUA plan to each of the options developed by the TIQ committee.

Public Comment GAC May 15, 2008 William Daspit

Thank you, Mr. Chairman and members of the committee for the opportunity to speak to you once again.

This Groundfish Allocation Committee has done a fairly good job of pulling all the pieces together for the Sector Allocation and the Trawl Rationalization Amendments. You should be happy with what you have accomplished. However, there are a few things that you have overlooked. This Groundfish Allocation Committee has not proposed a fair allocation plan for all fishermen. Only limited-entry trawl fishermen will be receiving individual allocations if the TIQ committee options are accepted. If Co-ops are implemented then those fishermen participating in Co-ops will not be receiving an individual allocation. Individual allocations are the essence of an IFQ system, but the system you are contemplating will not have individual allocations for all commercial fishermen. All fishermen must be included in an IFQ plan if it is to be successful. To exclude any portion of the commercial fleet sets up a plan for failure. The only measure of success is whether a sustainable management regime results. Wealth will proceed from a fishery that is managed sustainably. Co-ops do not allow individual fishermen to take responsibility for all of their actions. Allowing fishermen to make their own deals with individual processors is good. If Co-ops are implemented they will have a negative effect on sustainable practices. Implementing any processor shares is also not desirable since this would take shares away from fishermen. The overall quotas are so small that giving processor shares would drive many fishermen out of business. The most important part of any fishery management plan is how it impacts those who actually do the fishing. Processors don’t catch fish. Fishermen should be allowed to interact with individual processors in order to get the best price for their catch. This is the essence of a free enterprise system, which is a cornerstone of American business. Giving processor shares would be protecting processors from the effects of the free enterprise system.

The free enterprise system will be the system that produces a sustainable fishery. What is being proposed via the TIQ committee options is not rooted in free enterprise. Although in a few cases protecting an industry from the economic marketplace is desirable, protectionism is generally not helpful. Protectionism always ends up costing the taxpayers and consumers more. Those industries that are being protected must compete in the real economic world rather than an artificial one. The shoreside pacific whiting fishery is currently a protected industry. Under OSHUA this fishery will be incorporated into the commercial LE fishery. If a business is not profitable then it helps no one to implement regulations that keep unprofitable operations in business. One of the reasons that overfishing exists is because we protect unprofitable fishing and processing operations. Sustainable management means economically sustainable in addition to biologically sustainable. In fact, if a fishery is not economically sustainable it can not be biologically sustainable.

The law requires that the Council manage the fishery with the goal of achieving sustainability. For the Council to get involved in manipulating market flow or any other aspect of the fisher-processor economic relationship is a mistake. To spend any resources on fisher-processor issues that are best left to the economic market place is not a wise use of the very limited resources available. The Council should focus all of its resources on the relationship between fish and fishermen and remove itself from fisher-processor concerns. The OSHUA plan addresses only the relationship between fish and fishermen. The OSHUA plan addresses only that which is necessary. The OSHUA plan is a minimalist plan in that anything unnecessary is not included. Anything having to do with fisher-processor concerns is unnecessary in a fishery management plan. The only thing that is necessary are features that regulate how, when, and where fishermen catch fish. To include anything else in a fishery management plan immediately makes the plan unsustainable. Sustainability means leaving enough fish in order to propagate. Sustainability means fishermen having the opportunity to achieve successful businesses. Sustainability means leaving enough fish so that our children will be able to put fish on their dinner tables.

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MAY 1 9 2008
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May 14, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97229-1384

Dear Chairman Hansen and members of the Pacific Fishery Management Council:

This letter represents 10 (ten) trawl vessels from Eureka, California. The trawl history of the owners range from 5 to 30 years. We are very concerned about the division of the individual fisherman quotas (IFQ) that are being considered by the council.

The undersigned permit owners all agree that from the beginning of trawl quotas in the late 1980's to present that the trip limits have always been equal, no matter what, for each and every vessel.

We are adamantly opposed to any allocation of trawl fish that would based on 100% catch history or any shares allocated to any processors. If either of these two options were to take place it would devastate the trawl fleet in Eureka, California.

Sincerely,
Eureka Trawlers

F/V AL W GF# 0580,

F/V GOOD NEWS GF# 0392,

F/V MANDY J GF# 0540,

F/V STORMBRINGER GF# 0705,

F/V GERRY B GF# 0112,

F/V RENABEL GF# 0157,

F/V JOY ANN GF# 0196,

F/V FISHWISH GF# 0261,

F/V WARRIOR II GF# 0265,

F/V CLEONE GF# 0393,

Don Hansen
Pacific Fisheries Management Council
7700 N.East Ambassador Place suite 101
Portland, Or 97220

Dear Don Hansen and Council Members

This letter reprensents four trawl vessels from San Francisco to Half Moon Bay Ca. We are concerned of the IFQ possibilty with trawl history. this is not fair or equal, We had the Buy Back a few years ago and havent given that a chance to play out and now there is talk of IFQ. A hand full of boats will get most of the quota at the expense of the majorty of boats. If IFQ happends the boats with small quotas will sell to the boats with larger quotas and the boats will get out of the business which will be bad for the infrastructure of the industry, (ie, loss of jobs for crew, less boats to support fish buyers and services).

You might think IFQ worked well in Alaska in actualty a hand full of boats ended up with most of the quota, In Alaska it was a derby fishery and IFQ made it safer. It's not the case on the westcoast you have six two month periods to catch the equal quota so safety is not the issue, Seventy five persent of trawl fisherman I talk to are happy with the present system. Don't fix it if it is not broken. Sincerely

Bob Barchell

Sincerely
F/V Madeline
F/V Point Loma
F/V Lindy J
F/V Phlis J

My name is Bob Burchell I am 54 years old been fishing since I was 18. I own two boat with Trawl Ground Fish Permits and sold another permit to the Buy Back. I sincerely believe any IFQ system would be the down fall of the trawl fishery

Bob Burchell
707-9545977

DATE

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

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Dear Chairman Hansen and members of the Pacific Fishery Management Council,

I am a fish buyer/processor from … * and I am writing to ask you to oppose initial allocation of quota to processors in the IFQ program for the west coast trawl fleet. If quota is allocated to processors based on processing history, it will have a disastrous effect on small processors/buyers up and down the coast.

The way the alternatives are currently structured only a handful of the very largest processors would be eligible to receive any allocation. Such an allocation system will enable that small number of large processors to become even larger, and will make it easier for them to continue to squeeze out small processors/buyers. Large processors will become the beneficiaries of an even larger market advantage eliminating the potential for small buyers/processors to partner with fishermen on innovative marketing arrangements.

There is absolutely no justification for a giveaway of public trust resources to a handful of very large processing companies that will create such devastating impacts for other processors/buyers who are not entitled to receive a piece of the allocation pie. Please oppose initial allocation of quota to processors.

Sincerely,

Gerald E. Querand
1363 Thompson Rd.
Sequim, WA 98382

* Sequim, WA 98382

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May 13, 2008

Don Hansen
Pacific Fisheries Management Council
7700 N. East Ambassador Place ste 101
Portland Or. 97220

Dear Don Hansen and Fellow Council Members:

We are concerned about the division of the Individual Fisherman Quotas (IFQs) for the trawl industry. We are seven boats in Fort Bragg California who have discussed this at length. We all feel differently about how the quota should be divided, whether it be status quo, equal splits of the entire quota, or equal splits of the buyback fish only with catch history of the remainder. Two things that we agree upon, that we are adamantly opposed to, are using catch history for division of the entire quota and that no percentage of the quota should go to the processors. This type of division would be devastating to the trawl fleet of Noyo Harbor.

Sincerely,
Noyo Trawlers

F/V Tara Dawn
Sam P Estes

F/V Verna Jean
Vince Doyle

F/V Blue Pacific

F/V Northern Light
Randall Schlecht

F/V Miss Kelley II

F/V Miss Hailee
Robert E Kelly

F/V Donna J

P.F.M.C. COUNCIL

MAY 18, 2008

TO: N.M.F.C. @ I.F.Q'S
MR MCISAAC
GROUNDFISH MEMBERS

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DEAR SIRS,

THIS LETTER IS IN REFERENCE TO MY POSITION ON IFQ'S.
IT HAS COME TO THE ATTENTION OF MYSELF AND A LARGE NUMBER OF OTHER TRAWL FISHERMEN THAT CERTAIN ORGANIZATIONS AND SELF-SERVING INDIVIDUALS WERE SAYING "THE GENERAL CONSENSUS WAS IN FAVOR OF IFQ'S TO BE BASED ON PAST CATCH RECORDS". THIS IS NOT TRUE, IN A LAST MINUTE CONTACT OF MANY BOATS FROM CRESENT CITY TO MORRO BAY, THE MAJORITY SAY OPPOSITE. BASICALLY LEAVE IT STATUS-QUO AND EQUAL SHARES TO ALL LICENSES. THIS IS BASED ON THE FACT THAT ANYONE LEFT IN THE INDUSTRY AFTER SUCH "REMEDIES" AS BUY-BACK, LIMITS, VESSEL-TRACKING, AREA CLOSURES, OBSERVERS, ETC. HAVE FINALLY SETTLED IN ON A BUSINESS PLAN OF STATUS-QUO. SOME INDIVIDUALS AND BOATS, THAT ARE COMPANY OWNED, HAVE THE VIEW THAT THEY ARE ENTITLED TO A LARGER SHARE BASED ON PAST TONNAGE, SINCE THEY ARE CONTROLLED BY THEIR COMPANY THEY "SELF ALLOCATE" LIMITS LEAVING INDIVIDUALS "MARKET LEFTOVERS". THIS IS NOT ONLY UNFAIR TO THE BOATS BUT NOT IN THE INTEREST OF SMALL COMMUNITY BUYERS AND ULTIMATELY THE PUBLIC.

IF IT HAD BEEN FORESEEN THAT IFQ'S WOULD BE BASED ON CATCH HISTORY, ALL CONCERNED WOULD HAVE PUSHED THEMSELVES TO THE LIMIT. SINCE MAKING THESE "EX POST FACTO"-TYPE LAWS WE ARE ALL GOING TO BE HELD TO "PAST, USED-TO". HOW WOULD THE COUNCIL MEMEMBERS LIKT TO HAVE THEIR PENSIONS BASED ON WHAT THEIR EARNINGS WERE TEN TO TWENTY YEARS AGO?

SINCE THERE IS SUCH A MYRAMID OF POTENTIAL PROBLEMS, MOST OF THE BOATS THAT CONTACTED ME ARE OF THE OPINION "MAKE IT ALL EVEN" THUS HELPING TO EQUALIZIZE THE BASIS INFRASTRUCTURE OF OUR INDUSTRY FOR THE FUTURE OF EVERYONE.

SINCERELY,

[signature]

PRES. FARALLONES TRAWL CORP.

5775 OLD REDWOOD HWY.
SANTA ROSA, CA. 95403
707-838-7461

G.F. 0152 ALOHA
G.F. 0157 RENABEL
OREGON SHRIMP 9004A
CALIF. HALIBUT 08544
CA. L15053
CA. FARALLONES 08544
FARALLONES 241-862

May 19, 2008

Pacific Fisheries Management Council
7700 N.E. Ambassador, Suite 101
Portland, OR 97220-1384

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Council Members;

It has come to my attention that the Council may be considering allowing trawl vessels to harvest parts of their quotas with fixed gear.

As one of the few fishing vessels dual permitted with trawl and fixed gear, it would be more economical to target certain species of my quota with fixed gear rather than trawl.

I believe that fixed gear is more user friendly to the ocean floor than the foot line of a trawl net. In addition, I also believe there would be as much as a 50% reduction in fuel consumption.

Thank you for the Council's consideration of this matter. A decision in favor of these suggestions could only be positive for the fisheries.

Sincerely;

Richard Lilienthal

gf 0032
541-888-5366

May 21, 2008

BY FAX, EMAIL, and U.S. MAIL

Mr. Donald Hansen and Members of the Pacific Fishery Management Council
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Re: Public Comment on Proposed Amendment 20: Trawl Rationalization

Dear Mr. Hansen and Members of the Pacific Fishery Management Council:

Natural Resources Defense Council hereby submits the following recommendations concerning the selection of Preferred Alternatives under the Trawl Rationalization program.

A.1.1 Gear Switching: Support analysis of an additional option to convert trawl undirectionally towards less impactful gear

Right now the gear switching component is unfettered which would allow quota holders switch back and forth between gears at will. While convenient for the quota holders, this arrangement provides little or no conservation benefit and does nothing to help transition the fishery to a smaller trawl footprint.

We urge the Council to include an option for analysis that allows for a trial period (e.g. 2 years) but that eventually requires the quota holder to commit to switching to the less impactful gear permanently if she or he wants to continue using that gear.

We address this issue further with a separate letter to the Council.

A.1.2 IFQ Management Units: Support option to subdivide quota geographically

Subdividing quota geographically at the 40 10 line will help prevent isolated geographical depletion due to shifting fishing patterns.

A.2.1.3 Allocation Formula: Support Option 2 for overfished species

Option 1 would reward those who contributed most heavily to the poor condition of the overfished species. Option 2 avoids this outcome by instead allocating overfished species quota on an industry average basis.

A.2.2.1 Permit/IFQ holding requirement: Remove the option (#6) to allow a vessel to resume fishing after 2 years in deficit

The level of quota overage that would result in two year's deficit is extremely high, likely to be the result of repeated tows of depleted stock. We believe that individual incentive to stay within quota limits is essential to a properly functioning IFQ system. Fishermen who engage in risky fishing behavior should not be excused from individual responsibility.

A.2.2.3.e Grandfather Clause: Support no grandfather clause

Allowing everyone to reach the same level of quota ownership, without permitting a favored few to exceed that, is a fairer system. It also helps prevent too much consolidation of quota ownership.

A.2.3.1 Tracking and Monitoring: Support Option 3 –100% observer coverage with cameras if effective and feasible. No small vessel exception

100% observer coverage is necessary to achieve the conservation objective of reducing bycatch as well as improving accountability. Excusing small vessels from this requirement would create a gap in these features of the IFQ program.

A-3 Adaptive Management: Support having this option for the following potential uses:

- Achieving conservation results, such as rewarding clean fishing and encouraging gear switching
- Stabilizing vulnerable communities
- Compensating processors for demonstrated injury (e.g., economic evidence of stranded capital). This use should be limited to 3 years
- Managing unforeseen consequences

Having the flexibility to do adaptive management as the program unfolds could be a highly important tool for obtaining the objectives sought and mitigating against unforeseen impacts.

B.1.3.1 Non-coop fishery

While we have no reason to believe that coops are problematic, we are strongly concerned about the impact fishermen who may find themselves in the non-coop fishery could have. Such fishermen would be operating under a sector TAC and would have none of the conservation incentives an ITQ system is supposed to provide.

A-6 Fixed Term Auctions: Support fixed term auctions

We are deeply concerned that the value of the fishery stays in the fishery, to be used for sound management of the resource. An auction allocation system can help accomplish this and is a method which has been used successfully for other public resources. The 15 or 16 years before auctions would be implemented provides not only free use of the resource for this time, but also gives ample time to devise an appropriate system for implementation. There is the added benefit to this option of providing an avenue for new entrants to come into the fishery.

We believe that the impact of any potential decline in the stewardship incentive in the final years of the term would be offset by having sufficient observer coverage to ensure that fishermen stay within quotas and bycatch limits. In addition, we note that the alternative to this option (outright permit grants) are subject to the same possible loss of stewardship incentive behavior if that quota is leased out.

Thank you very much for your consideration of these comments.

Sincerely,

Karen B Garrison

Laura Pagano, Attorney
Karen Garrison, Oceans Program Co-Director
Natural Resources Defense Council
111 Sutter St., 20th Floor
San Francisco, CA 94104
(415) 875-6100

cc: Frank Lockhart

May 21, 2008

Donald K. Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Re: Identifying Gear Conversion Alternative for Analysis in the Trawl Rationalization Environmental Impact Statement

Dear Chair Hansen and Members of the Council:

On behalf of NRDC, we respectfully ask the Council to evaluate one more alternative for changing gears, in addition to the option for indiscriminate gear switching that you currently plan to analyze in the Trawl Rationalization Environmental Impact Statement (EIS). Specifically, *we recommend analysis of a long-term, uni-directional conversion option (from trawl to an alternate gear) after a trial period of up to two years, with potential flexibility to switch among alternative gears*. The rest of this letter refers to those two options as "switching" and "conversion."

The point of allowing gear switching or conversion is to help achieve the objectives of the trawl rationalization program. We believe a well designed gear conversion option will better meet those objectives, particularly those related to minimizing ecological effects (objective 3) and adverse impacts on other fisheries (objective 5). As such, this option deserves consideration in the EIS. Furthermore, the report on gear conversion produced by Dr. Lekelia Jenkins found that the terms and design of a gear switching or conversion program make a significant difference.[1] Evaluating an additional option will provide analysis of a reasonable range of alternatives and give the Council more information and better choices as you design that program.

According to the best available science (Dr. Jenkins' report), a gear conversion program can help trawlers minimize ecological impacts by allowing them to fish instead with gears that have lower bycatch and discard mortality and reduced impacts on habitat. Dr. Jenkins' gear conversion report confirms that pots and longlines have orders of magnitude less bycatch mortality for most species and significantly lower habitat impacts than trawl gear in the sablefish fishery (Gear Conversion Report, pp. 11 – 21). To the extent trawlers use indiscriminate gear switching to supplement, not substitute for

[1] Jenkins, Lekelia D., Gear Conversion as a Means to Reduce Bycatch and Habitat Impacts in the U.S. West Coast Sablefish Fishery, March 2008.

trawling, switching may not result in any significant shrinking of the trawl footprint. In contrast, long-term conversion could make a major reduction in the trawl footprint possible—particularly in high-bycatch areas—without a significant economic cost.

Gear conversion can serve a second set of objectives: to provide additional economic opportunity and operational flexibility for fishermen (objectives 2, 4, and 7). For example, a fisherman whose trawl opportunities are constrained by living in a region prone to high bycatch of depleted species might be able to reap economic benefits by switching to pots that virtually eliminate bycatch while providing a high quality product. Allowing use of alternate gears encourages fishermen to use their ingenuity and try gears that with potential economic and ecological benefits. The conversion option doesn't have to involve a loss of flexibility, if it includes a trial period during which a fisherman can experiment with alternative gears and return to trawl if the results prove unsatisfactory.

Gear conversion, as an alternative to indiscriminate gear switching, could serve a third objective: to minimize adverse effects of the trawl rationalization program on other fisheries (objective 5). Analysis may show that with the long-term conversion option the impacts on other fisheries are more likely to stabilize after an initial adjustment period, allowing managers to better assess and address those impacts. Long-term conversion could be very attractive to trawlers who are severely restricted under the present management system, due to small boat size and/or high bycatch rates near their ports. For such individuals, gear conversion may offer a viable option for continuing to fish, and a means of maintaining a supply of fish to vulnerable ports.

There may be ways to combine the best features of these two scenarios for shifting gears. The analysis may identify other important sideboards for this program. Analyzing both alternatives will give the Council will cover a reasonable range of possibilities and provide the Council with an array of options. We respectfully request that you include both indiscriminate gear switching and long-term gear conversion in the EIS analysis. We appreciate the opportunity to comment.

Sincerely,

Karen Garrison, Oceans Program Co-Director
Laura Pagano, Attorney
Natural Resources Defense Council
111 Sutter St., 20th Floor
San Francisco, CA 94104
(415) 875-6100

Cc: Frank Lockhart

Gear Conversion as a Means to Reduce Bycatch and Habitat Impacts in the U.S. West Coast Sablefish Fishery

by Dr. Lekelia D. Jenkins

March, 2008

Acknowledgments

The author would like to thank the following people for reviewing the portions of this report relevant to their area of expertise. The views presented in this document do not necessarily reflect the opinions of those who helped review it. Jim Hastie's assistance in providing data and scientific advice was invaluable. Many thanks also to the 44 people who generously gave their time in the interview process.

Reviewers

Merrick Burden
John DeVore
Bob Eder
Keith Matteson
Rod Moore
Lance Morgan
Margaret Spring
Johanna Thomas

TABLE OF CONTENTS

Executive Summary

The purpose of this study is to examine the value and feasibility of gear conversion as a means to reduce bycatch and habitat impacts of fisheries. The U.S. west coast sablefish fishery (off California, Oregon and Washington) is an excellent subject for this study, because it employs three different gear types: bottom trawls, bottom longlines, and fish pots (traps). Currently, a permit to use one of these gears does not allow conversion to another gear regardless of potential environmental or economic benefits of doing so. Sablefish is a groundfish that frequents a variety of habitats including muddy, sandy and rocky bottoms. The sablefish fishery spans the west coast.

Since 1998, the management of the fishery has been guided by the need to rebuild overfished groundfish stocks—bocaccio rockfish, canary rockfish, cowcod rockfish, darkblotched rockfish, lingcod (now rebuilt), Pacific ocean perch, widow rockfish, and yelloweye rockfish. Unfortunately, these species often co-occur in the same areas as sablefish and so are caught as bycatch. Managers assume that 100% of many discarded rockfish die, because rockfish species have pressure-sensitive swim bladders. If these fish are brought to the surface from deep waters, the swim bladder often explodes and kills or disables the fish. Minimizing bycatch mortality is important both because of the need to rebuild overfished species and because the Magnuson-Stevens Fishery Conservation and Management Act requires bycatch minimization.

Longlines and pots (traps) are managed together in the limited-entry fixed gear sector with separate gear endorsements (i.e., permits are either endorsed for longlines or pots/traps). The size of the permitted limited-entry trawl and fixed gear sablefishing fishery is nearly the same— about 170 permits each, but only about 120 trawlers actively fish each year. The amount of sablefish landed by each fleet has been around the same order of magnitude in recent years with almost 2300 mt (metric tons) landed by each in 2005.

Using published data from the West Coast Groundfish Observer Program, I graphed the bycatch ratios and standard errors for each gear type over time, per depth category, and for each overfished species. I used some of this data in a snapshot analysis of a spatiotemporal period in which the trawl and fixed gear fisheries were actively operating under similar regulatory conditions. This analysis allowed the most direct comparison of the bycatch rates of the three gear types. I supplemented the results of this analysis by conducting an analysis of data gathered by the Oregon Department of Fish & Wildlife during a study to compare pot and longlines as survey tools for sablefish.

In order to assess habitat impacts of the gear, I drew upon the “Shifting Gears” study. This study used an extensive literature review and expert panel to rank ten gear types according to their impact on physical structure, seafloor organisms, shellfish and crabs, finfish, seabirds and turtles, marine mammals, and sharks. Using this study as a baseline, I conducted interviews with sablefish longliners, trawlers, pot fishers and other stakeholders in the sablefish fishery. Based on these interviews and my own expertise in fishing gear, I adjusted, when necessary, the results of the Shifting Gears study to more accurately represent the sablefish fishery.

To make a qualitative assessment of the potential costs, benefits, problems, and solutions associated with gear conversion, I conducted a series of interviews with a total of 44 individuals, representing trawlers, pot and line fishermen, processors, managers,

scientists and an environmental NGO. I analyzed these data with a loose application of Ground Theory methodology, which allowed me to identify common themes and construct explanatory theories. Based on the initial interview analysis, I composed management scenarios, which I presented in follow-up interviews to key individuals for their feedback. Furthermore, I used the interviews to seek and identify potential conservation technologies that could be applied in the sablefish fishery to reduce bycatch and habitat impacts.

This report presents evidence that the inherent bycatch rates of trawls are substantially greater than those of longlines and pots. Bycatch rates of pots and longlines are quite similar, but there is a consistent trend for the bycatch rates of pots to be the lowest of the three gear types. However, pots may be more susceptible to the bycatch of rounder-bodied fish, such as lingcod. Depending on where the gear is deployed, longlines may have bycatch of yelloweye and canary rockfish--often the most constraining overfished shelf species in recent years. In addition, there is a lack of data on shark bycatch for longlines, which adds to the uncertainties in using this gear.

The Shifting Gears study shows that trawls have a substantially greater impact on habitat than do longlines and pots. With the adjustments I made to tailor the pot impact profile to the sablefish fishery, I show that pots have more severe habitat impacts than longlines. The use of small footrope trawls and selective flatfish trawls on the west coast serve to reduce habitat impacts associated with bottom trawling while reducing rockfish bycatch. In addition, National Marine Fisheries Service is currently developing several conservation technologies for various Alaskan Fisheries. The most promising of these is a trawl modification that greatly reduces bottom contact without reducing the number of fish caught. This technology would be compatible with the west coast groundfishing trawl gear, and holds some potential for reducing habitat impacts on sandy and muddy ocean floor.

Perceived pros and cons of gear conversion varied widely, both within and between stakeholder groups. However, several motifs repeatedly emerged from interviews. Positive effects of gear conversion included that: (1) it would allow for better management of the fish populations by reducing bycatch; (2) it would allow more business options and flexibility for some current trawlers; and (3) sablefish caught with fixed gear would reap a higher selling price, and thus would be a financially workable option for the trawlers who switch gears. The most prominent negative economic impact of gear switching was that with fewer trawlers, less flatfish would be caught. The sale and processing of flatfish is a substantial component of the groundfish trawl industry. Presently, flatfish can only be effectively caught in trawls, so, for certain members of the current fishing industry community to remain viable, some number of trawlers must remain active. The survey also revealed that all major stakeholder groups saw some benefit in gear conversion. Most fixed-gear fishermen and women interviewed were not opposed to trawls switching to fixed-gear, though more than one expressed concern that the ability to make that switch would not relieve the ongoing problem of overcapitalization in the groundfish fishery.[1] Notably, trawlers voiced a unanimous preference for converting to pots rather than longlines.

[1] A recent buyout reduced capacity in the groundfish trawl fleet to some degree, and the PFMC aims to further reduce it via a trawl rationalization initiative that may include management by individual fishing quotas and/or harvest cooperatives. However, targets for capacity reduction have not been updated since

Given the available information, I find that a conversion from trawl gear to either pots or longlines could significantly reduce bycatch and habitat impacts of the sablefish fleet. However, pots may be the preferable gear given trawlers' interest in pots and the potential of longlines to increase the bycatch of yelloweye and canary rockfish. Because the bycatch situation may change in the future, a gear conversion program should have flexibility to allow for use of pot or longline gear as well as other forms of hook and line gear when appropriate.

I presented four different management scenarios to the interviewees: (1) with permanent uni-directional gear conversion, trawlers would be offered an opportunity to make a one-time irreversible switch to pot or longline gear; (2) with long-term uni-directional gear conversion, trawlers would have the opportunity to switch to pot or longline gear for a multi-year term; (3) with pre-declared bi-directional gear switching trawlers would have the opportunity to switch between trawl and fixed-gear within the same fishing season; (4) with unconstrained gear switching, trawlers would be able to switch between trawl and fixed-gear within the same fishing season without needing to declare when they planned to switch or how much fish they planned to catch with each gear type.

Of these scenarios, the preferable option from an accountability perspective would be long-term uni-directional gear conversion. This scenario could be effectively overseen by the current management and observer program infrastructure. It would have a real benefit in reducing bycatch, because trawlers would commit to using fixed gear for several years. Because of the long-term commitment, some trawlers, especially those with the highest volume, are not likely to convert to an alternative gear. Their continued landings should allow the processors and other volume-based shoreside infrastructure to continue operating. Short-term or unconstrained gear switching could only be done in an accountable fashion if 100% observer coverage were maintained.

Incentives are likely to be an important means of encouraging gear conversion. As an incentive to convert their gear, trawlers who switched could receive a higher catch limit of sablefish, reflective of the lower bycatch rates of fixed gear. Other incentives include encouraging good gear practices by using a portion of the "adaptive management trust" quota to reward those who consistently meet a standard of minimal bycatch over a period of time; a trial period during which trawlers could change their mind before making a long-term conversion; and low-interest loans to help purchase new gear.

Future study topics include the following. (1) Explore in more depth the benefits and impacts of various gear-conversion scenarios, including other gear types, such as hook and line and vertical longline. (2) Conduct a GIS analysis of the types of seafloor habitat in the sablefish fishing area and the concentration of each gear type in these habitats. The study should examine the past and present gear distribution, as well as attempt to forecast the gear distribution under different gear switching scenarios. It should also research the impacts of different gears in various habitats and the feasibility of an area-based management system for each gear type. (3) Investigate additional potential incentives to encourage switching to lower impact gears. (4) Examine the feasibility of using the conservation technologies being developed for the Alaskan fisheries in the west coast groundfish trawl fishery.

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the decade-old strategic plan, in which the Council set a goal of 50% reduction in capacity for each groundfish gear group.

PURPOSE OF STUDY

The purpose of this study is to examine the feasibility of gear conversion as a means to reduce bycatch and habitat impacts of fisheries. The U.S. west coast sablefish fishery was selected as the subject of study, because this fishery uses three different gear types—bottom trawls, bottom longlines, and fish pots—with no interchangeability between gear types. This offers a rare opportunity to compare the use of several different gear types in the same fishery. In addition there are five years of available observer data on this fishery (NMFS 2003; NMFS 2004a; NMFS 2004b; NMFS 2005b; NMFS 2005c; NMFS 2005a; Hastie 2006; Hastie and Bellman 2006; Hastie, Cusick et al. 2006; NMFS 2006a; NMFS 2006b). These data will allow the examination of bycatch of overfished and other species by each gear type over time and by depth. Currently, a permit to use one of these gears does not allow conversion to another gear regardless of potential environmental or economic benefits of doing so.

This was a two-phase study; both phases are summarized in this report. Phase I details the relative bycatch and habitat impacts of the three gear types. It ranks the gear according to the intensity of their environmental impacts and includes findings about the most desirable gear to which to convert. Phase II of this study involved a survey of fishermen/women, observers, and managers about gear conversion to determine qualitatively the costs and benefits as well as impediments and their potential resolutions.

NRDC invited a diverse group of managers, government scientists and stakeholders (including representatives of processors, each relevant gear group, gear experts, and conservation NGOs) to review a draft of this report. Their comments were considered in light of the data and incorporated wherever appropriate.

FISHERY OVERVIEW

The U.S. west coast commercial sablefish fishery is managed as part of the west coast groundfish fishery (Pacific Fisheries Management Council and National Marine Fisheries Service 2007). The groundfish fishery ranges the length of the coast from Alaska through California and occurs in nearshore waters shallower than 50 fathoms (fm) to off the continental shelf. Management of this fishery is under the jurisdiction of the National Marine Fisheries Service and its advisors, the Pacific Fishery Management Council (PFMC) and the North Pacific Fisheries Management Council. Each council has its own management framework and regulations. This study focuses on the groundfish fishery in the PFMC's jurisdiction, off California, Oregon and Washington. Sablefish is a species of groundfish that frequents a variety of habitats including muddy, sandy and rocky bottoms. The fishery for this species employs bottoms trawls, bottom longlines, and pots.

Active management of the groundfish fishery began in the 1980s with the determination of optimum yields and trip limits for several species, including sablefish. Since 1998, the management of the fishery has been guided by the need to rebuild overfished groundfish stocks, which are bocaccio rockfish, canary rockfish, cowcod rockfish, darkblotched rockfish, lingcod (now rebuilt), Pacific ocean perch, widow rockfish, and yelloweye rockfish.[2] Minimizing sablefish bycatch mortality is also important both because bycatch minimization is required by the Magnuson-Stevens Fishery Conservation and Management Act and because the sablefish population is in the precautionary zone, with a predicted downward trajectory in future years under an assumption of average future recruitment.

More than 80 species of groundfish are managed under the fishery management plan. Each species has its own habitat requirements as far as depth, bottom type, water temperature, etc. Some of these species are associated with a diverse range of habitats, while other are restricted in their distribution. Often healthy groundfish stocks will co-occur with overfished stocks. Management measures have recognized and tried to account for problems posed by this overlap. It is assumed that 100% of many discarded rockfish die, because rockfish species have pressure-sensitive swim bladders. If these fish are brought to the surface, the swim bladder explodes and kills the fish. Sablefish do not have swim bladders, so, if properly handled, sablefish can have low discard mortality.

The management program establishes catch limits that take into account both target catch and bycatch of managed species.[3] In order not to exceed optimum yield, the management regime for the commercial fishery applies a suite of tools including time/area closures, gear modifications, and larger trip limits in areas where overfished species are less likely to be encountered. Also fishermen and women are required to sort the catch by species or species group, discard prohibited species (e.g. salmon, Pacific halibut, and Dungeness crab), and discard groundfish that exceed the allotted trip limit. In 2002, fishery managers began using a new bycatch analysis model. The resulting information allowed managers to set trip limits that targeted abundant stocks during times when they are least likely to co-occur with overfished stocks. Also in 2002, the Council began implementing depth-based area closures, where bottom fishing is prohibited to reduce encounters with and mortality of overfished stocks. These Rockfish Conservation Areas (RCAs) have boundaries that may change every two years based on changes in catch levels and rebuilding plans, and may vary seasonally depending on factors like the distribution of the overfished stocks.[4]

In addition to the formation of the trawl and non-trawl RCAs, the Council has adopted several gear restrictions. In 2000, the Council placed restrictions on trawl gear in an attempt to protect overfished shelf rockfish species that inhabit rocky areas. Specifically, it prohibited the landing of shelf rockfish and most flatfish caught using large footrope chafing gear. Because only trawls with a large diameter footrope chafing gear are rugged enough to fish on rocky bottoms, this regulation created an economic

[2] These species were declared overfished at different times during this period as follows: bocaccio, lingcod, and Pacific ocean perch in 1999; cowcod and canary in 2000; darkblotched and widow in 2001; and yelloweye in 2002.

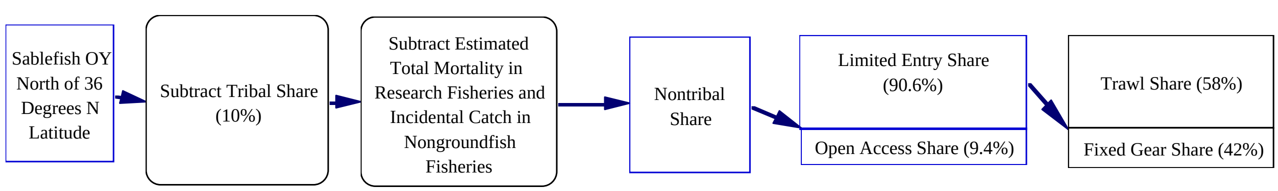
[3] Acceptable biological catches and optimum yields are specified for each managed species or species complex

[4] The commercial non-trawl RCA has changed little since its inception in 2003, largely due to lack of logbooks and other data informing vessel distribution and area-specific catch. The trawl RCA is more flexible and the shoreward and seaward boundaries can change in-season to take advantage of seasonal shoreward/seaward migrations of target and overfished species. This is due to a greater amount of vessel-specific catch and effort data from logbooks and on-board observers. In all circumstances, there is a core area (100-150 fm) that has always been closed since RCAs were first implemented.

disincentive to use that gear on the shelf, effectively ending trawling in shelf and nearshore rocky areas. Beginning in 2003, only small footropes were allowed shoreward of the RCA, thus expressly prohibiting large footrope gear from being used on the shelf. In 2005, the Council mandated the use of the selective flatfish trawls shoreward of the trawl RCA in the fishing areas north of Cape Mendocino.[5] The selective flatfish trawl is also known as the upside-down trawl or pineapple trawl. It is a small footrope trawl with a cut-back head rope and low profile, which allows rockfish to escape.

In August 2002, the National Marine Fisheries Service (NMFS) implemented the West Coast Groundfish Observer Program (WCGOP). The goal of the program is to collect data to improve estimates of total catch and discards in the groundfish fishery. The regulation requires that all vessels fishing for groundfish in the U.S. exclusive economic zone take an observer onboard when notified to do so by NMFS. Adequate coverage of the non-whiting bottom-trawl fleets was the initial priority. Coverage has broadened over time, and subsequent state regulations require that Oregon and California-based fishermen/women, who fish in state-managed fisheries, but may catch federally managed groundfish, also participate in the NMFS observer program. Target observer coverage over the years has ranged from 10 to 20% for both trawls and fixed gear. Actual observer coverage (by weight of total landed catch) has ranged from 8 to 38% for longlines, 6 to 46% for pots, and 13 to 29% for trawls.

In 1994, the federal government instituted a limited-entry permit system in order to restructure the derby fishery for groundfish into a longer season with catch levels more evenly distributed over time. The program limited the number of trawl, longline, and pot permits and placed conditions on the use of the remaining permits. Each permit specifies the type of gear and the length of vessel that may be used for fishing. Although it prevented new entrants, the program did not address the underlying problem of overcapacity in this fishery. Subsequently, the Pacific Fishery Management Council modified the permit system to allow fixed-gear (i.e. longlines and pots) to accumulate or “stack” up to three sablefish-endorsed permits, thus increasing the portion of the total sablefish quota available to each fixed gear vessel. The amount of catch available to each sector is based on an allocation formula established in the Groundfish Fishery Management Plan (FMP), and the total allowable catch is determined by the stock assessment (and the rebuilding plan, in the case of overfished species). The limited-entry allocations are based on the estimated abundance of sablefish north of 36º N. lat. as follows:



In 2003, a federally-sponsored program retired 92 trawl permits and vessels, reducing the size of the trawl fishery by over a third. In 2005, there were 178 limited-entry trawl permits of which 169 were usable in the bottom-trawl fishery, which includes sablefish as a target species. Of these permits about 120 were attached to vessels that

[5] north of 40°10' N latitude

landed fish in 2005 for a total of 2291 metric tons (mt) of sablefish. That same year, there were 230 limited-entry fixed-gear permits, of which 164 were sablefish-endorsed, of these 136 were endorsed for use with longlines and the remaining 28 were endorsed for use with pots. This fishery landed 2243 metric tons mt of sablefish in 2005. These statistics show that the number of permits available for fishing in the trawl and fixed-gear limited-entry sablefishing fleets is nearly the same (Fig. 1). Furthermore, the realized sablefish fishing capacities of both fleets are nearly the same as well (Fig. 2).

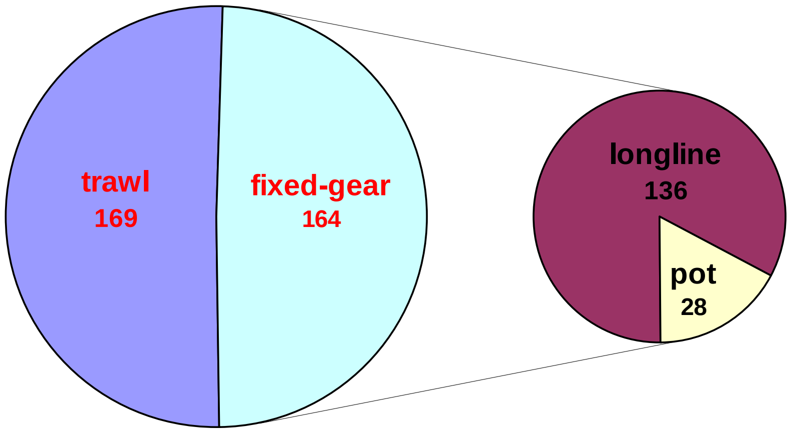


Figure 1: Number of sablefish permits per gear type in 2005 (data from NMFS 2006a; NMFS 2006b)

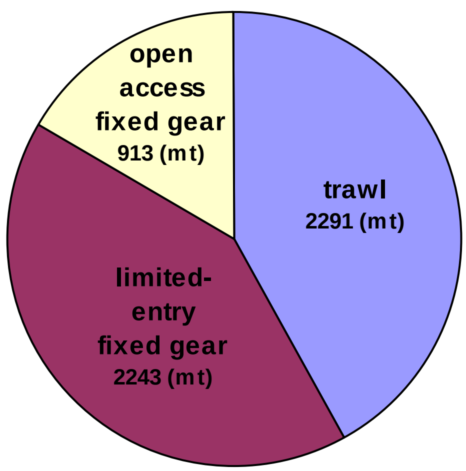


Figure 2: Metric tons of sablefish landed by trawls, limited-entry fixed-gear, and open-access fixed-gear in 2005 (data from NMFS 2006a; NMFS 2006b)

Some non-trawl vessels targeting sablefish are exempt from the limited-entry program and so remain in the open access fishery and subject to trip limits.[6] In 2005, this

[6] There are also limited-entry fixed-gear permits without sablefish endorsements that are subject to limited-entry fixed-gear trip limits, which may be larger than open access trip limits.

fishery landed 913 mt of sablefish, which is over 15% of the total sablefish landings that year (Fig. 2). The observer coverage of the open-access fishery is poor and multiple gears are allowed in this fishery.[7] For these reasons, it is difficult to link the discard rates of the open-access fishery with a specific gear type and so the open-access fishery will not be analyzed as part of this study. Nor will the recreational groundfish fishery be analyzed due to the use of different gear and the limited data on this fishery. The recreational groundfish fishery is mostly restricted to shallow waters—around 30 fm or less—and is managed with a combination of bag limits, gear restrictions, size limits, and time/area closures.[8]

GEAR DESCRIPTIONS

Trawl Fishing Gear and Process

The sablefish bottom trawl fishery operates throughout the year in offshore waters. Groundfish bottom trawl vessels range in length from 35 to 100 feet and average 65 feet. The vessel pulls a single trawl net (Fig. 3), which on an average-sized boat would be about 100 feet wide. The length of a typical tow is about 6 hours and covers a distance of about 12 miles. During a tow, heavy metal doors or boards (Fig. 3) drag along the sea floor. The water moves past them, pushing the doors apart and forcing the mouth of the net to open. A string of floats along the top of the net mouth, called the floatline or headrope, pulls the top of the net open. A weighted line along the bottom of the net mouth, called the footrope, leadline, or bottomline, keeps the trawl in contact with the sea floor. The doors are attached to the net by sweeps also known as bridles. The sweeps are each about 65 fathoms long and are covered in mud gear, i.e. small rubber disks. The majority of the trawls' bottom contact is due to the sweeps. As the sweeps drag along the seafloor they form a mud cloud that is thought to help herd the fish. The mouth of the net intercepts fish that are funneled to and collected in the codend. At the end of a tow, the codend is brought aboard the boat and emptied. In order to trawl along rugged bottom and protect the net from damage, trawlers may use rollers or chafing gear on their nets. Typically for the sablefish fishery, this special gear consists of rubber disks (Fig. 4) three to twelve inches in diameter that are punched from old tires and placed at regular intervals along the footrope. The complex of footrope and chafing gear is referred to as ground gear.

[7] Besides longlines and pots/traps, allowable open access gears also include vertical hook and line gears, which can be used to target sablefish.
[8] There are recreational opportunities in deeper water, such as those targeting Pacific halibut, where groundfish (including sablefish) are incidentally caught.

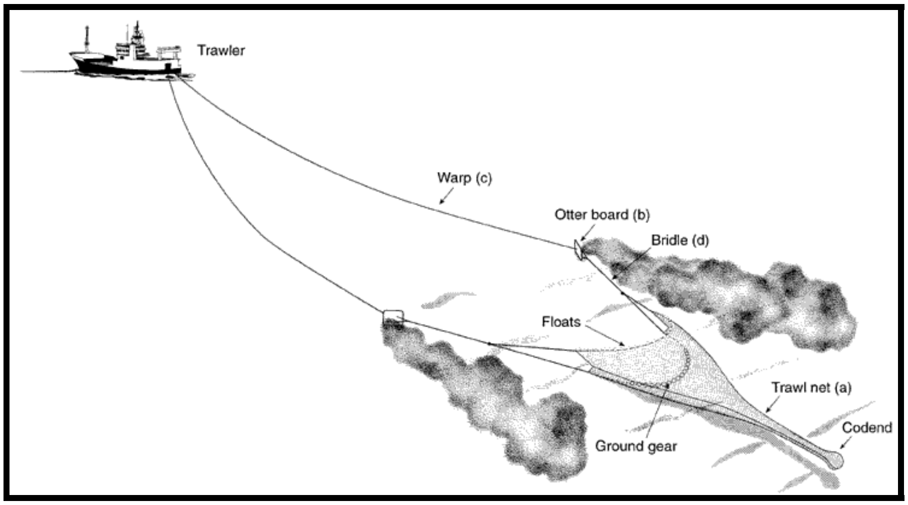


Figure 3: Diagram of bottom trawl gear
(courtesy of Christopher Kubiak)


Figure 4: Photograph of a trawl net with orange floatline and black rubber footrope gear.
(courtesy of Christopher Kubiak)

Trawlers often target multiple groundfish species. This in combination with the low selectivity of trawl gear results in a very diverse catch. A single tow will typically net 15-20 different species. The size and weight of individual fish and total catch vary greatly from tow to tow, but the total catch is often thousands of pounds. A significant portion of the catch from each tow is discarded at sea because it is not marketable, prohibited to bring to port, of small size, or of little value. But due to the extended sorting time—characteristic of trawling—and physical trauma caused by the net, mortality of discarded sablefish in the trawl fishery is likely high, especially relative to fixed gears. Fishery managers assume that 50% of sablefish die after being released from a trawl.

<u>Sablefish Fixed-Gear Fishery</u>

The sablefish fixed-gear fishery consists of pot/trap fishing and bottom longlining (and at least one instance of vertical longline). The primary fishing season lasts for seven months from April to October each year.[9] Most of the vessels in this fishery operate out of Washington and Oregon ports and fish primarily north of Monterey, CA. The vessels range in length from 33 to 95 feet. Unlike the trawl fishery, the fixed-gear fishery primarily targets a single species—sablefish.[10] However, there are still some discards for much the same reasons as in the trawl fishery. Longlines and pots allow the catch to be sorted soon after it is brought aboard, thus fish mortality is lower for fixed-gear than for trawls. Based on a few limited studies, fishery managers assume a discard mortality of 20% for sablefish targeted by fixed-gear.

Longline Fishing Gear and Process:

A typical longlining vessel in the sablefish fishery is about 50 feet in length. Longlining gear (Fig. 5) consists of a weighted groundline or mainline that sinks to the seafloor (Smolowitz 1998). Attached to the groundline typically at about 40 inch intervals are shorter lines, called gangions, which have baited hooks at the end. An average-sized vessel would deploy or set about 2 miles of line with approximately 3000 hooks. Once set, the gear, which is marked with floats, would be left to fish or soak for about six hours. The gear is then mechanically hauled in. A fisherman/woman will sort the catch as it comes onboard. Most unwanted fish will be discarded directly into the water without ever coming onboard the boat.

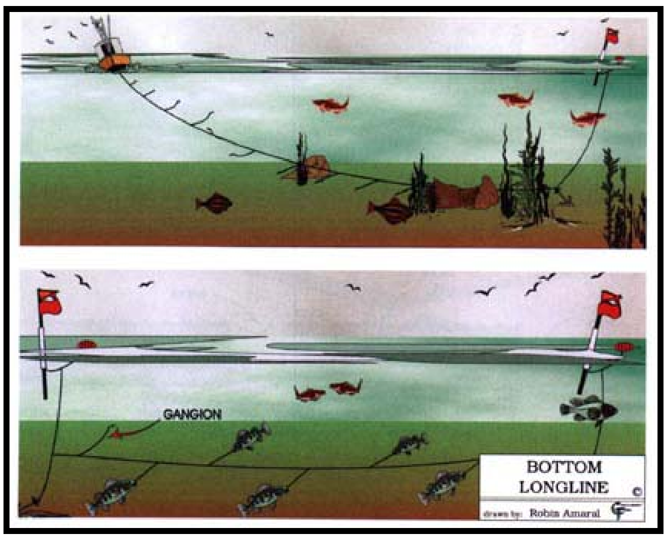


Figure 5: A bottom longline being set (top) and the gear once fully deployed (bottom).
(from Smolowitz 1998)

[9] The primary sablefish fishery is open only to limited-entry fixed gear permittees with sablefish endorsements. Other limited-entry fixed gear fishermen can participate in the limited-entry daily trip limit fishery year-round (unless the allocation is taken). Once a limited-entry fixed gear fisherman with a sablefish endorsement catches their tier limit in the primary season, they can then participate in the daily trip limit fishery.

[10] While sablefish is a primary target for the limited-entry fixed gear sector, slope rockfish are also targeted in significant numbers, especially in southern California.

Pot Fishing Gear and Process:

The pot fishery for sablefish uses fish traps which are often conical (Fig. 6) in shape, but may also be rectangular (Fig. 7). The conical pots are the preferred gear, because they are collapsible and stackable and so allow fishermen/women to carry more gear on their vessels. A typical conical pot is 54 inches in diameter at it base, has a steel frame covered in synthetic mesh, is equipped with two 4-inch escape rings to allow undersized fish to exit the pot, and has a biodegradable escape area, also called a rot cord, rot panel or escape panel.[11] The rot cord helps to prevent continued fishing if the gear is lost (i.e., ghost fishing). The baited pots are set on the ocean floor along a trotline typically with about 40 pots spaced at 120 to 150 feet intervals. Typically a pot vessel will make five individual sets for a total of about 200 pots fishing simultaneously. Fishermen/women leave the pots, which are marked with floats, to soak for 15-20 hours before hauling in the gear. Some pot fishers bring their gear into port after each fishing trip, while others may leave their gear unattended in the water and return at a later time to rebait the pots.

Figure 6: Conical sablefish pot
(from http://www.ladnertraps.com/bcod.htm)

[11] Escape rings are voluntarily used by most of the fishery. Escape panels are mandated by a regulation that states "Traps must have biodegradable escape panels constructed with 21 or smaller untreated cotton twine in such a manner that an opening at least 8 inches (20.3 cm) in diameter results when the twine deteriorates." (50CFR660.382)

Figure 7: Rectangular sablefish pot
(from http://www.ladnertraps.com/bcod.htm)

METHODS

Bycatch Analysis

Without designing an experiment specific to the purpose, analyzing the comparative bycatch rates of different gear types is difficult. The existing observer data are collected for the purpose of monitoring the effectiveness of fishing regulations. Because trawls and fixed-gear are often regulated differently (i.e., different time/area closures and retention allowances for bycatch species), the bycatch data are not directly comparable between gear types.

With the advisory help of Jim Hastie, of NOAA Fisheries, I identified data that would yield the most direct comparison between gear types. This data subset consists of data collected during April to October 2004 in the northern fishing area (north of 40°10' N lat). This was a time and place when both trawl and fixed gear fleets were actively fishing. Furthermore the subset only includes data from depths greater than 150 fm, because this was the only depth category used in both trawl and fixed gear reports that was also outside of the RCAs. The limitation of this approach is that it is only a "snapshot" analysis. Subsequent sections of this report will examine trends over time, depth, and by overfished species in order to identify potential weak points in this snapshot analysis.

I supplemented the results of this analysis by conducting an analysis of data gathered by the Oregon Department of Fish & Wildlife (ODFW) during a study to compare pot and longlines as survey tools for sablefish. ODFW conducted this study in May 1999 in a 2200 square mile area from north of Newport, Oregon up to Tillamook Bay and ranging from 124º 20' W to 125º 20' W. Using one boat equipped with longline gear and another equipped with pots, ODFW made six sets at three different depths (200, 600, and 900 fathoms) for a total of 18 sets for each gear type. Each gear type was assigned to sample sites on an alternating basis. Pots had a soak time of at least 24 hours and longlines had a soak time of at least 6 hours.

Using bar charts to allow visual comparison, I graphed the bycatch ratios (a calculation of the pounds of each bycatch species that are caught for every hundred pounds of target species) of each gear type. When available I included the standard errors as recorded in the West Coast Groundfish Observer Program (WCGOP) reports. The error bars give a measure of the consistency of the observed levels of bycatch used to calculate the bycatch ratio.

I conducted much of the bycatch analysis in this report using the published data from the WCGOP. In order to best determine the level of bycatch characteristic of each gear, I used bycatch ratios rather than total bycatch. Total bycatch is not a good measure of gear performance because the amount of bycatch is directly linked to the amount of fishing effort. On the other hand, a bycatch ratio is a measure that allows the balanced comparison of bycatch rates.

$$\text{Bycatch Ratio} = \frac{\text{total pounds of bycatch}}{\text{total pounds of target species}}$$

Because the bycatch rates in the sablefish fishery are often very small, the WCGOP reports record the bycatch ratio as per 100 pounds of target species.

$$\text{Bycatch Ratio X } \frac{100}{100} = \frac{\text{pounds of bycatch}}{\text{100 pounds of target species}}$$

For longlines and pots, the bycatch ratio is calculated using just retained sablefish, because this is the gross majority of the target catch. For trawls—which target a dozen or more species—the bycatch ratio is calculated using all the retained target species.

Habitat Impact Analysis

There is little data available on the impacts of west coast groundfish fishing gear. Thus an analysis would have to draw from studies of similar gear in other areas. In 2003, the Marine Conservation Biology Institute completed “Shifting Gears”, a comprehensive review of gear impacts in U.S. waters. Using data compiled from over 170 sources, an expert panel of 13 fishermen, managers, and scientists examined ten commercial gear classes, including bottom trawls, bottom longlines, and pots. The panel’s analysis was reported using a five-point scale, to assess the impacts of each gear on physical structure, seafloor organisms, shellfish and crabs, finfish, seabirds and turtles, marine mammals, and sharks.

Using this study as a baseline, I interviewed sablefish longliners, trawlers, pot fishermen, and other stakeholders in the sablefish fishery. Based on these interviews and my own expertise in fishing gear I adjusted, when necessary, the results of the Shifting Gears to more accurately represent the sablefish fishery.

Gear switching feasibility analysis

In order to make a qualitative assessment of the potential costs, benefits, problems, and solutions associated with gear switching, I conducted a series of unstructured and semi-structured interviews (see Appendix Two for a copy of the interview instrument). I built the sample populations using the survey method of snowballing, in which interviewees recommend other potential interviewees. With a combination of face-to-face, phone, and e-mail interviews, I surveyed a total of 44 individuals, representing trawlers, pot fishers, hook and line fishers, processors, managers, scientists and environmental NGOs (see Appendix One for a detailed breakdown of sample population demographics). I took written notes of the face-to-face and phone interviews and, when possible, also recorded the interviews for future reference. I analyzed these data with a loose application of Ground Theory methodology, which allowed me to identify common themes and construct explanatory theories.

FINDINGS & DISCUSSION

Gear Comparison Snapshot Analysis

In order to minimize the effects of variables such as fishing depth and season, I sought to identify a period in time where both trawls and fixed-gear were actively operating under similar regulations. This occurred from April to October 2004 in the northern fishing area (north of 40° 10' N lat.) in waters deeper than 150 fathoms. During this spatiotemporal period there were 206 observed longline sets and 130 observed pot sets. The number of observed trawl tows could not be quantified in time for this report.

A comparison of bycatch ratios for each gear type shows that trawls consistently have the highest bycatch rates, as much as three orders of magnitude more bycatch in the case of deepwater species like darkblotched rockfish and Pacific ocean perch (Table 1). Bycatch rates of longlines and pots are approximately the same with negligible differences— amounting to roughly 1/1000 of a pound of bycatch for every 100 lbs of target fish, except in a few specific instances of interest.

Overfished Species (2004 status)	Bycatch Ratio (lbs. of bycatch species caught per 100 lbs. of retained target catch)			Relative Ranking
	Longline	Pot	Trawl	
Bocaccio	0	0	0-.001	T>L,P
Canary	.07	0	.009-.01	L>T>P
Cowcod	0	0	0	T=L=P
Darkblotched	.068	.033	2.196-6.291	T>L>P
Lingcod	.363	.659	.106-.201	P>L>T
Pacific ocean perch	.006	.003	1.706-1.471	T>P>L
Widow	0	.001	.013-.14	T>P>L
Yelloweye	.037	0	0-.004	L>T>P

Table 1: Comparison under similar regulatory and spatiotemporal conditions (April-October 2004, north of 40° 10' N lat., >150 fm) of bycatch of eight overfished species by longline, trawl, and pot gear (data from NMFS 2005c; NMFS 2005a)

The notable exceptions to these trends are lingcod, canary rockfish, and yelloweye rockfish. Longline bycatch of canary rockfish and yelloweye rockfish is an order of magnitude greater than the bycatch of these species caught using other gear. This difference is very important give the low allowable catch levels for these species and can be credited to the fact that longlines can more easily access the rocky habitat that these species inhabit. The prohibition on large diameter footropes in shelf habitat effectively eliminates trawling in areas where canary and yelloweye are located.

Due to the lack of readily comparable data for trawls and substantially higher bycatch for trawls, the remainder of this report will focus on determining the relative differences between longlines and pots.

Simultaneous comparison of pots and longlines

Data collect by the ODFW allowed the direct comparison of species bycatch rates by longlines and pots. Based on the reported poundage of fish caught, I was able to calculate a bycatch ratio for each bycatch species. Because this was data from a research rather than commercial fishing cruise, there was no discard of sablefish. Thus, the bycatch ratio is based on total pounds of sablefish caught not pounds of sablefish retained. For this reason, the bycatch ratios may be an underestimate of what would have occurred in a commercial setting. Also the deepest depths observed in the study were beyond those typically set in by commercial longliners and so may not be representative of a commercial situation. Compared to pots, longlines had 100 times as much total bycatch per 100 lbs of sablefish (Fig. 8). Most of the bycatch, in terms of number of species, occurred in the 200 fm depth zone (Fig. 9). In terms of pounds of bycatch, most occurred in the 600 fm depth zone. At all the observed depths, longlines had the highest level of bycatch, both in number of species and pounds caught. Notably in this study, the only bycatch of an overfished species—darkblotched rockfish—was caught by a longline. At 200 fm, pots did have bycatch of two species—rosethorn rockfish and redbanded rockfish—that were not caught by longlines. Bycatch at 400 fm and 600 fm was minimal for pots but more substantial for longlines, especially of two grenadier species (Fig. 10).

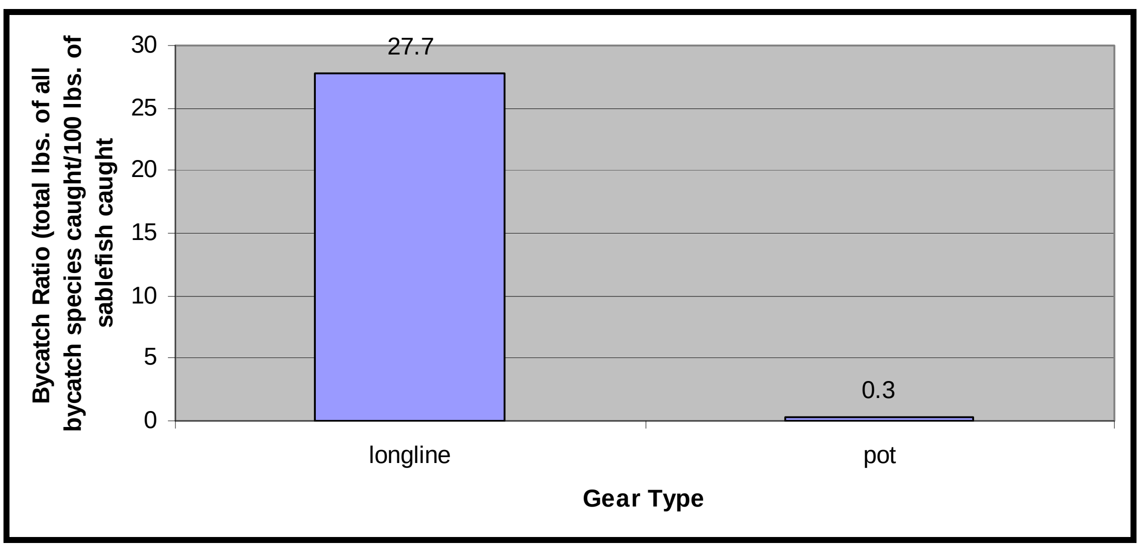


Figure 8: Bycatch ratios of pots and longlines for the sum total of all bycatch species during a simultaneous comparative gear study (data from Matteson, Hannah et al. 2001).

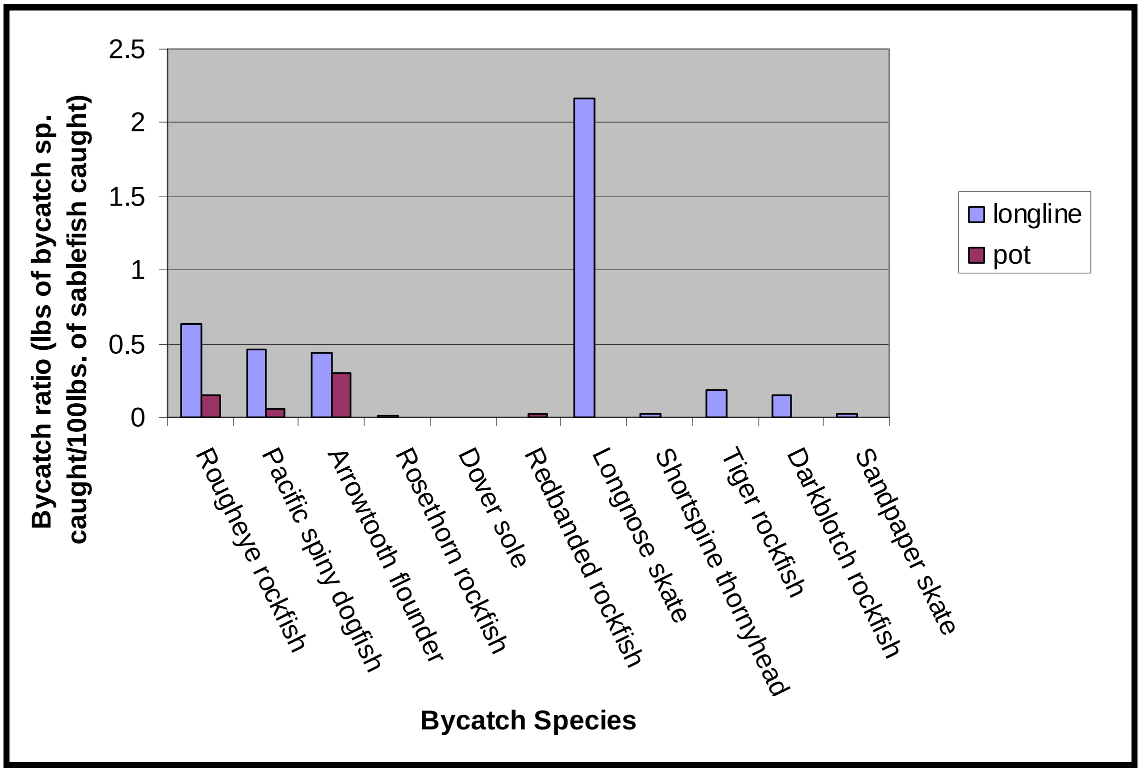


Figure 9: Bycatch ratios of pots and longlines set in 200 fm during a simultaneous comparative gear study (data from Matteson, Hannah et al. 2001).

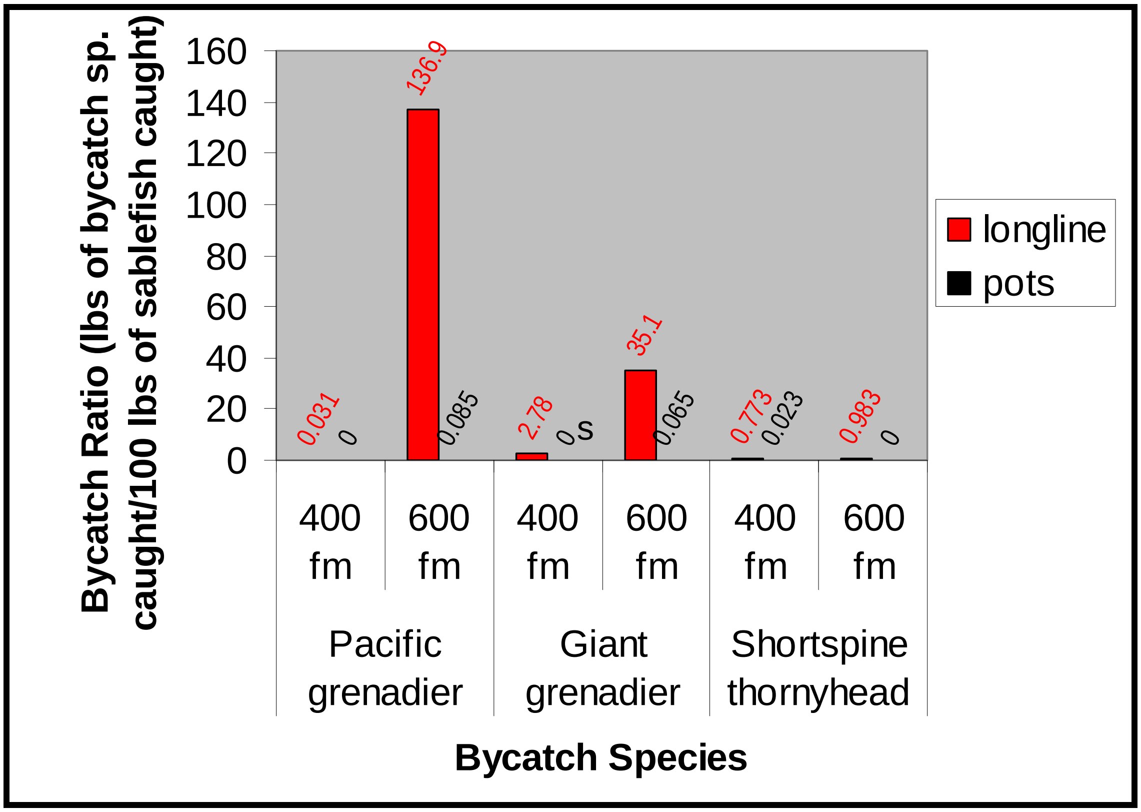


Figure 10: Bycatch ratios of pots and longlines set in 400 fm and 600 fm during a simultaneous comparative gear study (data from Matteson, Hannah et al. 2001).

<u>Bycatch comparison by gear over time using observer data</u>

A comparison of the bycatch ratio for each gear type for the period of 2001-2005 reveals that bycatch rates remain similar within each gear type. In other words, time (and any associated changes in the ecosystem or management measures) had little effect on bycatch rates for the fixed gear sablefish fishery. Discard rates of sablefish remained approximately the same (Fig. 11). The spike in discards of sablefish by pots in 2004 is likely an artifact of observing a pot fisherman that did not use escape rings. Although escape rings are not mandatory, most pot fishers use them, so the bycatch rates for pots in 2004 are likely not representative of the pot fishery as a whole.

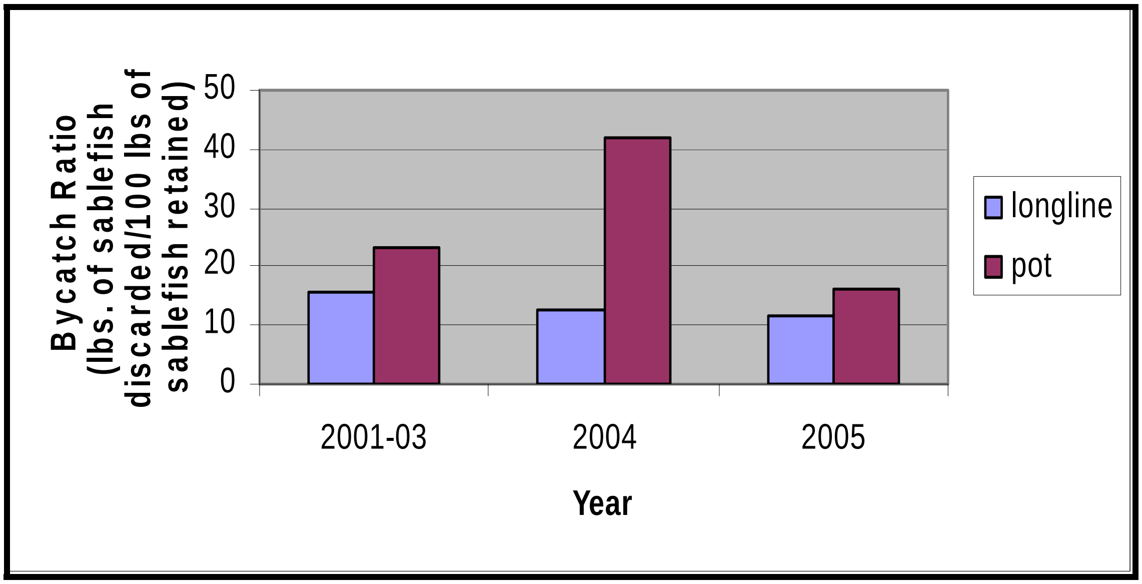


Figure 11: Comparative discard rates of sablefish by longline and pots from 2001-2005 (data from NMFS 2004b; NMFS 2005a; NMFS 2006b)

Bycatch rates for many of the overfished species remained approximately the same over time with the exception of canary rockfish, darkblotched, and lingcod. (Widow rockfish and cowcod rockfish were also analyzed but bycatch ratios were too small to be included in the graphs below.) Relative to other years, there were marked increases in bycatch of canary rockfish in 2004 and of darkblotched rockfish in 2005 by longlines (Fig. 12). While the rates of bycatch more than tripled, the difference between these and other years remained small at about 0.3 lbs of canary for every 100 lbs. of retained sablefish and about 0.1 lbs of darkblotched for every 100 lbs of retained sablefish. These increases in bycatch rates could be due to any one or combination of reasons, but is probably due to changes in the depth of the RCA.

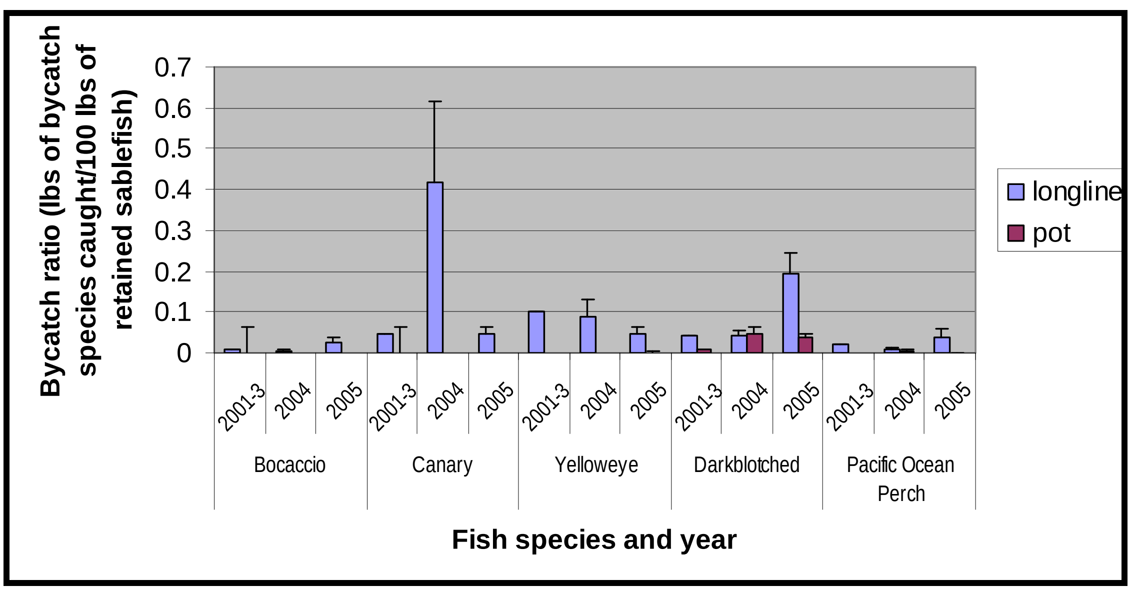


Figure 12: Comparative bycatch of five overfished species by longlines and pots from 2001-2005 (data from NMFS 2004b; NMFS 2005a; NMFS 2006b)

The bycatch of lingcod varied by as much as 0.5 lbs of lingcod per 100 lbs of retained sablefish (Fig. 13). Notably in 2005, bycatch of lingcod by longlines was nearly twice that of pots, an almost exact reversal of the pattern from 2004. The high lingcod bycatch rates by pots in 2004 are likely due to the observation of a pot fisher who did not use escape rings. The steadily increasing bycatch of lingcod by longlines is indicative of the increasing population size, which was declared rebuilt in 2005.

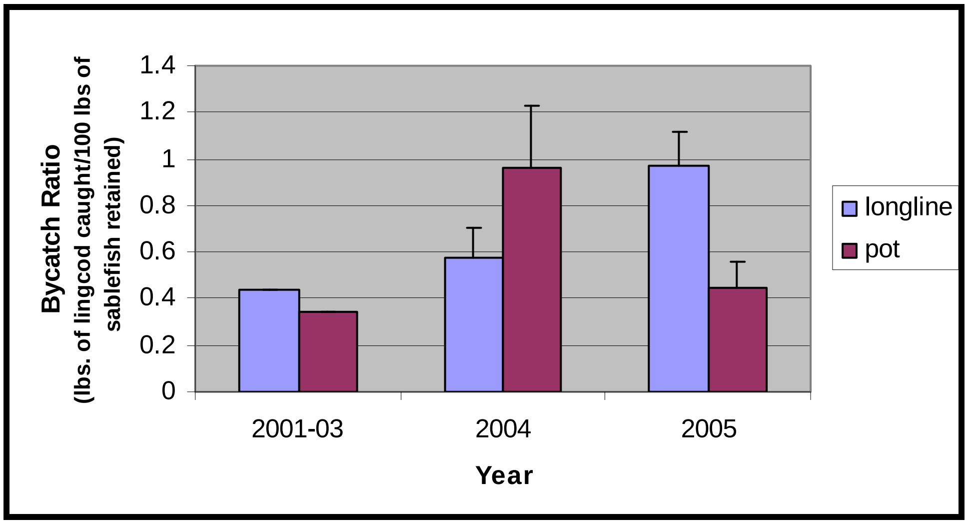


Figure 13: Comparative bycatch of lingcod by longline and pots from 2001-2005 (data from NMFS 2004b; NMFS 2005a; NMFS 2006b)

Bycatch comparison by gear and depth

Discards of sablefish (fish thrown out because they are too small or otherwise not marketable) are fairly consistent across depths (Fig. 14). This is indicative of the fact that sablefish are the target of the fishery, are widespread, and frequent a variety of habitat types. In contrast six of the eight overfished species (according to their 2004 status) show strong bycatch trends across depths (Figs. 15-20). (Bycatch of cowcod rockfish and bocaccio rockfish was too limited to graph.) These strong depth trends confirm that depth-based area closures must be considered in any analysis of the west coast groundfish fishery. This limits our ability to make direct comparisons between gears, because depth-based area closures differ for trawls and fixed gear.

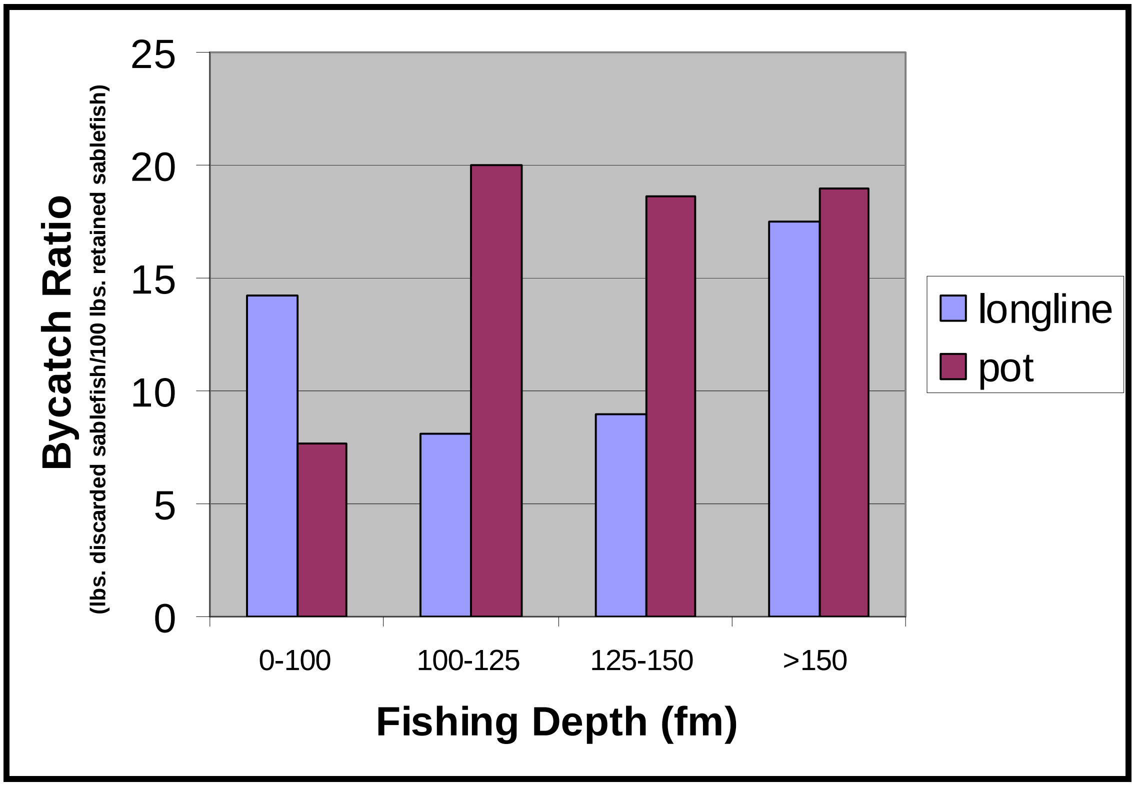


Figure 14: Comparative bycatch by depth of sablefish by longlines and pots during the period of 2001-2003 (data from NMFS 2004b)

Notably, at the depth (> 150 fm) of the direct gear comparison (Table 1), bycatch rates of overfished species were quite low except for Pacific ocean perch and darkblotched rockfish (Figs. 19-20). These were also the two species for which trawls had the greatest relative bycatch rates. This may suggest that in the direct gear comparison (Table 1) catch rates of the other six overfished species were too low in deep water to make a *discernable* difference in gear bycatch rates. In other words, the bycatch rates for these six species as depicted in Figure 8 may underestimate the inherent bycatch rates of the gear. This underestimate would most likely be greatest for trawls, because of their lack of selectivity. To determine the validity of these conjectures, future studies should attempt to identify and analyze bycatch in spatiotemporal areas in shallower depths, where trawls and fixed-gear are actively operating under similar regulatory conditions.

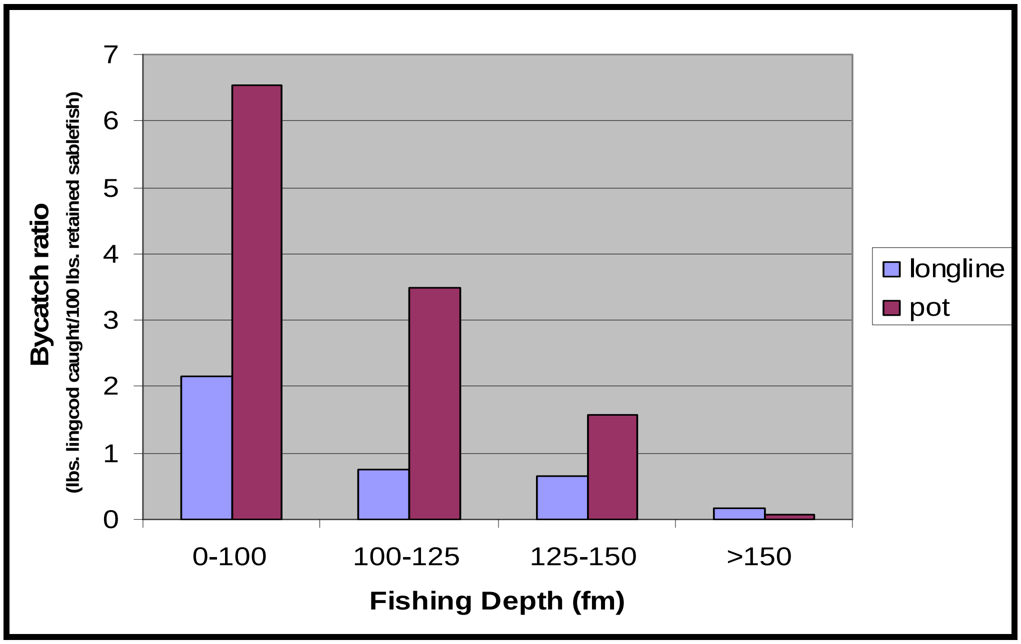


Figure 15: Comparative bycatch by depth of lingcod by longlines and pots during the period of 2001-2003 (data from NMFS 2004b)

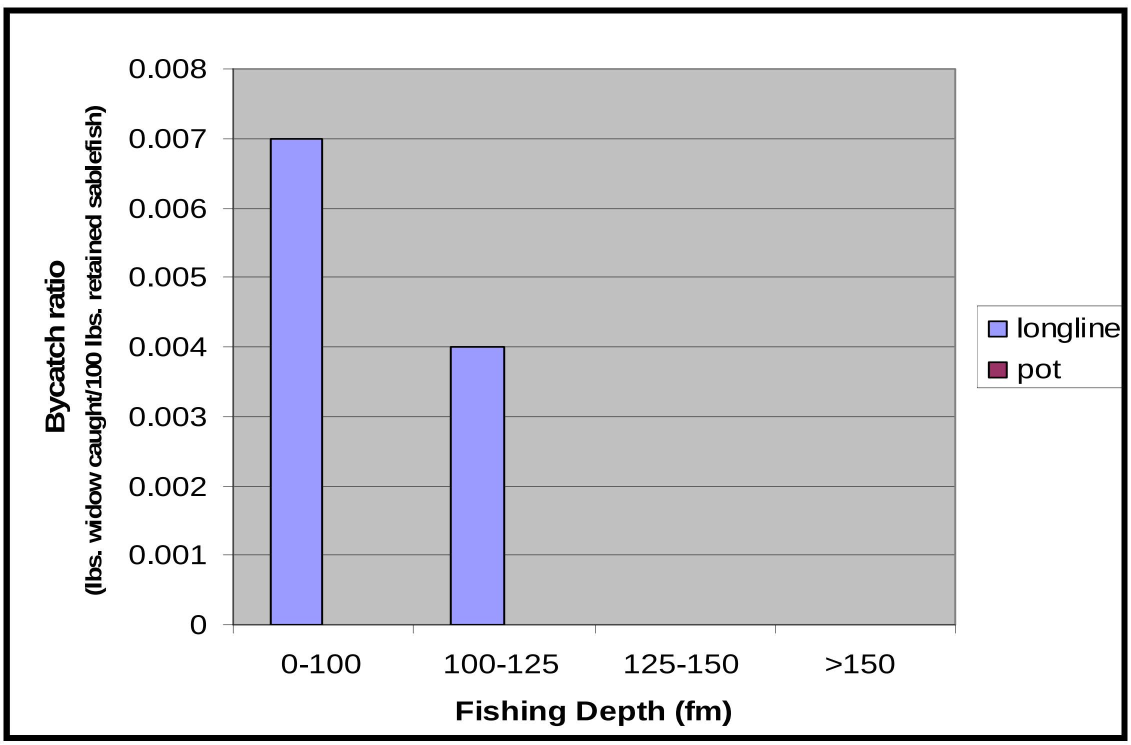


Figure 16: Comparative bycatch by depth of widow rockfish by longlines and pots during the period of 2001-2003 (data from NMFS 2004b)

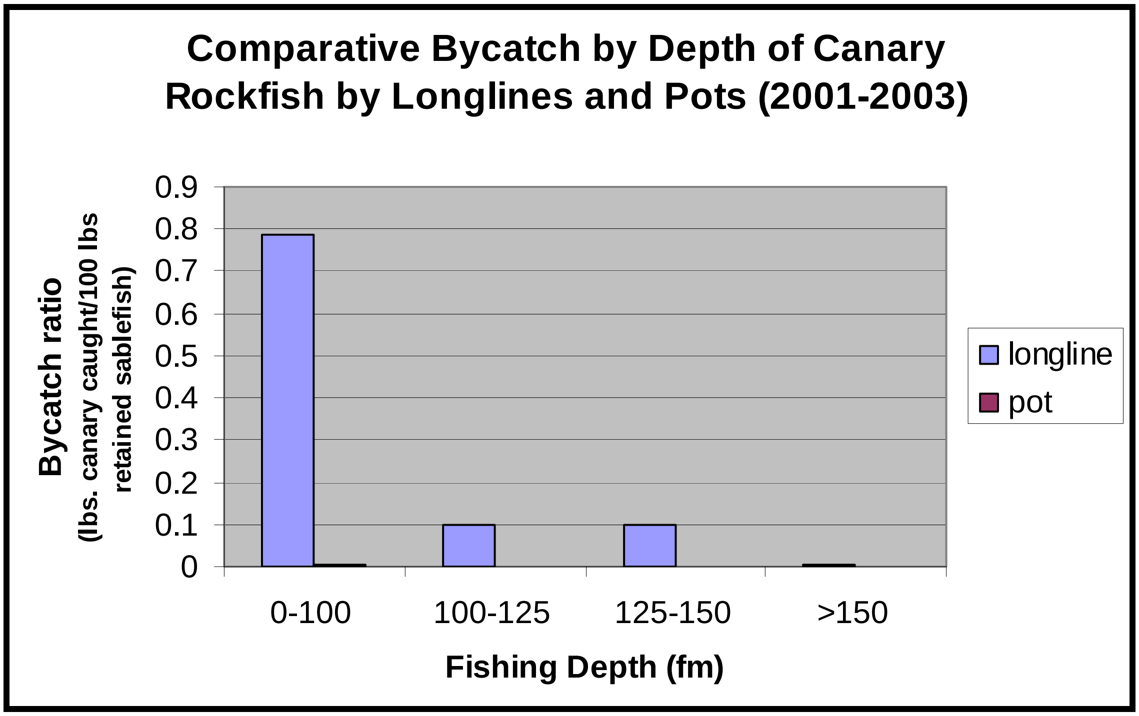


Figure 17: Comparative bycatch by depth of canary rockfish by longlines and pots during the period of 2001-2003 (data from NMFS 2004b)

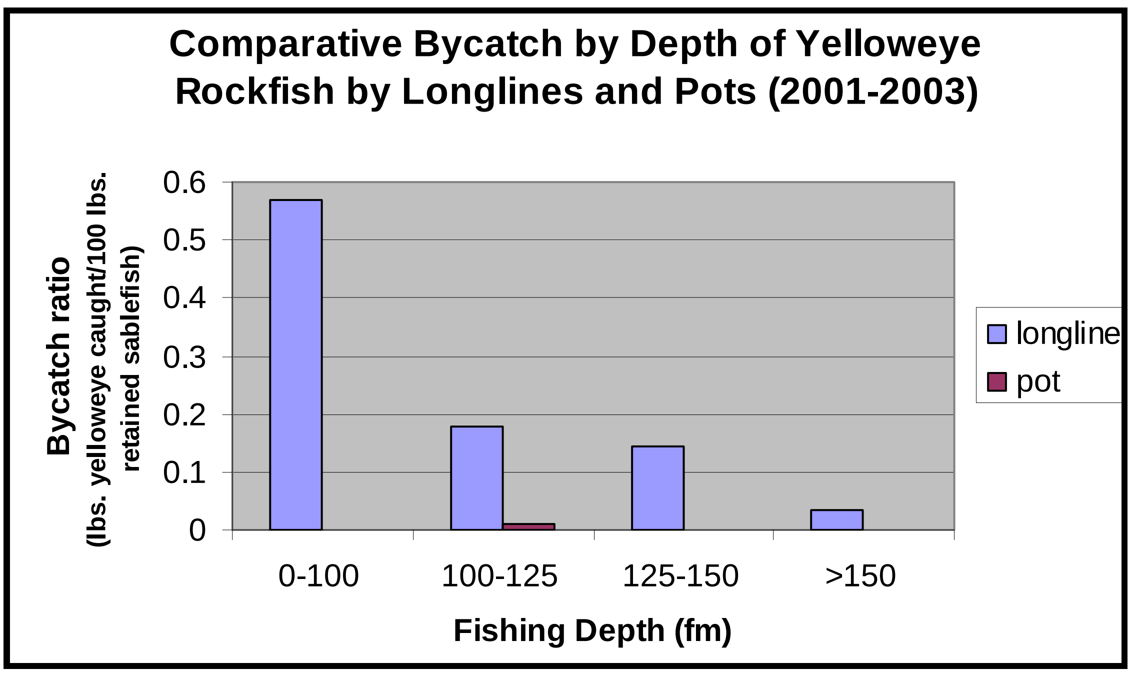


Figure 18: Comparative bycatch by depth of yelloweye rockfish by longlines and pots during the period of 2001-2003 (data from NMFS 2004b).

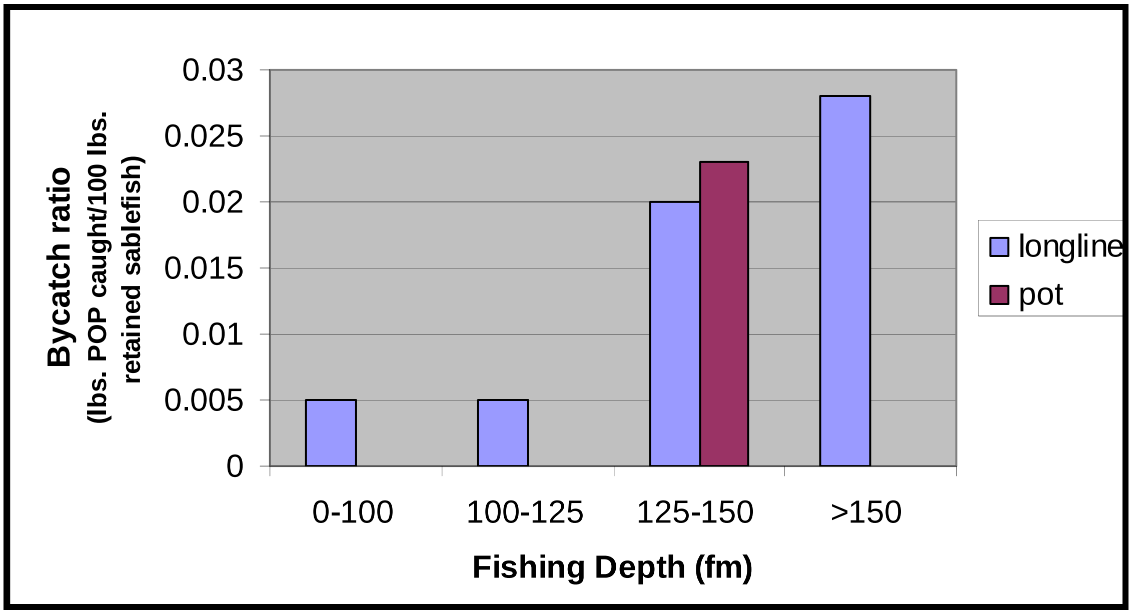


Figure 19: Comparative bycatch by depth of Pacific ocean perch (POP) by longlines and pots during the period of 2001-2003 (data from NMFS 2004b).

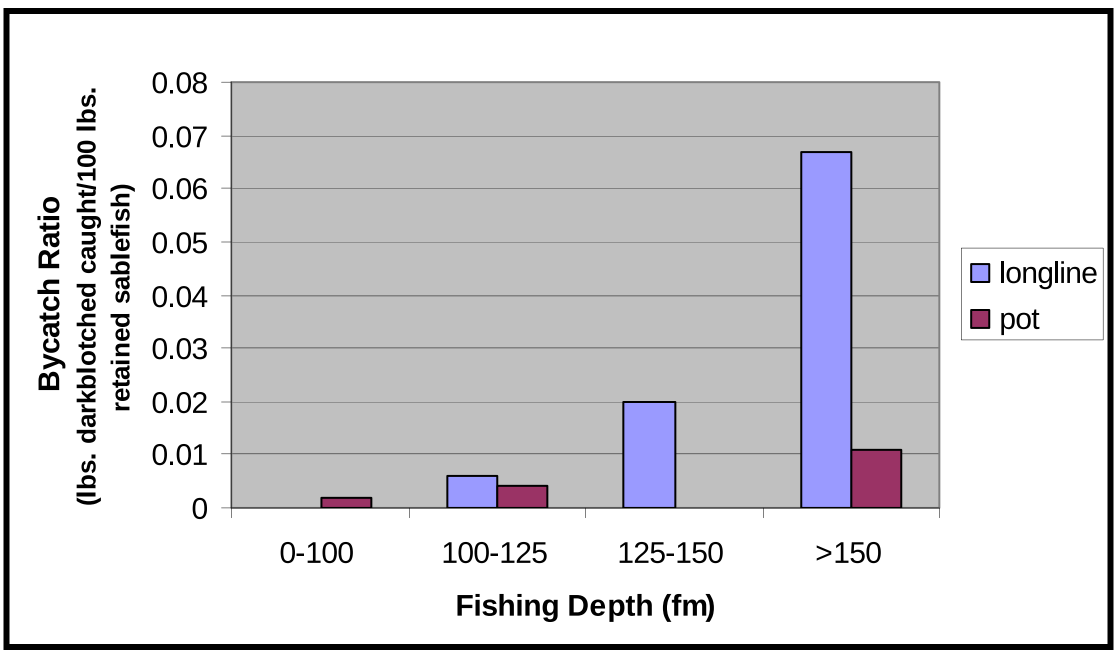


Figure 20: Comparative bycatch by depth of darkblotched rockfish by longlines and pots during the period of 2001-2003 (data from NMFS 2004b).

Habitat Impacts

Because of the lack of research in the northeastern Pacific, habitat impacts of bottom longlines, bottom trawls, and pots must be extrapolated from studies done in other areas. The “Shifting Gears” study did just this. The study considered gear impacts on physical structure, seafloor organisms, shellfish and crabs, finfish, sharks, marine mammals, as well as seabirds and turtles. The study found that on a 100 point scale—with 1 being the least severe—the cumulative impact scores for bottom trawls, pots and traps, and bottom longlines were 91, 38, and 30, respectively (Morgan and Chuenpagdee 2003).

The breakdown of the bottom trawl impact score shows that bottom trawls were rated as having the highest possible severity score for habitat impacts (Fig. 21). The bottom gear on trawls tends to smooth and compact the seabed and harm invertebrates such as sponges and corals (National Research Council 2002). Trawls also increase turbidity, reducing primary productivity and contributing to anoxia. Additionally they disturb hard structures, such as boulders, reducing the available feeding and sheltering habitat. The study also gave finfish bycatch by bottom trawls the highest impact score. This corresponds with and supports the findings in the sablefish fishery that bottom trawls had higher bycatch ratios of most of the overfished species, which are all finfish.

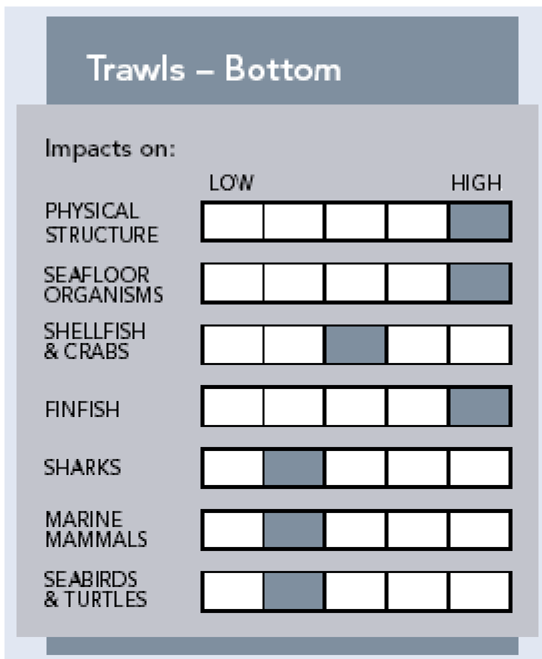


Figure 21: Impact rating of bottom trawls as agreed by 13 expert “Shifting Gears” workshop participants (from “Shifting Gears” by L. Morgan and R. Chuenpagdee 2003)

The breakdown of bottom longlining impact score shows that its habitat impacts were rated low. The report does note that hauling in of the line may cause hooks to snag, abrading rocks, corals, and sponges. This damage is magnified if the gear is hauled in mechanically. The impact score breakdown reveals that the areas of greatest concern are finfish (Fig. 22). The available synthesized data on the sablefish fishery does not include useful information on shark bycatch and seabird bycatch, so the appropriateness of this rating can not be determined. Given the present global concern for the health of shark and seabird populations, this would be crucial future research to conduct.

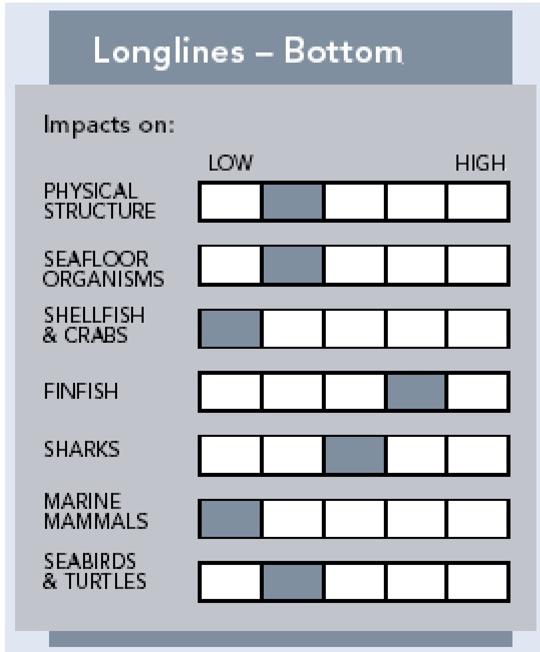


Figure 22: Impact rating of bottom longlines as agreed by 13 expert "Shifting Gears" workshop participants (from "Shifting Gears" by L. Morgan and R. Chuenpagdee 2003)

Of the three gear types and their use globally, pots vary the most in their form and function. Thus, the general impact profile for this gear type (Fig. 23) is not as directly applicable to the sablefish fishery. I therefore adjusted the profile for the sablefish pot fishery (Fig. 24), based on interviews with pot fishers and my understanding of how the specifics of sablefish pot fishing differ from the pot fishing considered in the Shifting Gears report. I did not use the Shifting Gears methods in making these adjustments.[12]

[12] The Shifting Gears study drew on the combined expertise of a panel of 13 fishers, managers, and scientists. Using the Shifting Gears methods would be an extensive process beyond the scope of this project. Such an endeavor would involve reconvening the panel to analyze the sablefish fishery and reanalyzing the data. Rather my approach was to make illustrative changes to the graphs that were indicative of a general increase or decrease in impact. I did not attempt to add or subtract value from the actual data set. Recognizing that their report was an average and might not correctly represent individual fisheries, the authors of the Shifting Gear report recommended the judicious tailoring of their findings.

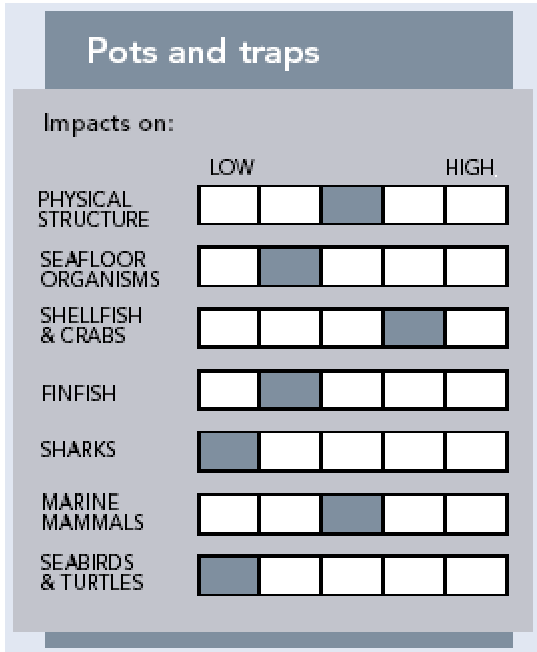


Figure 23: Impact rating of pots and traps as agreed by 13 expert "Shifting Gears" workshop participants (from "Shifting Gears" by L. Morgan and R. Chuenpagdee 2003)

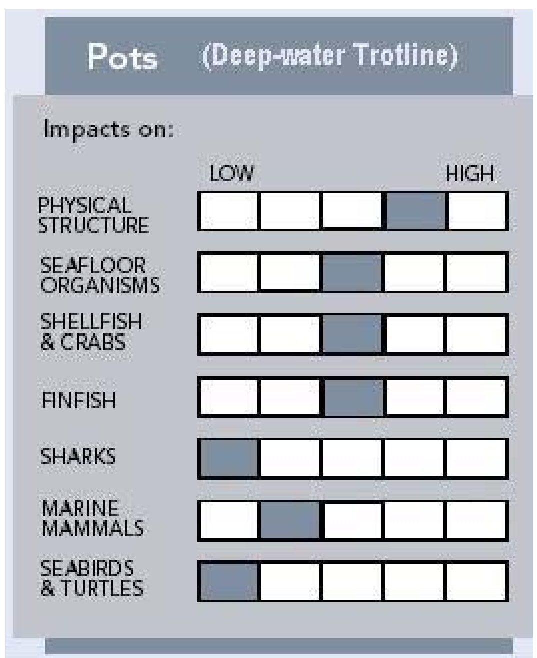


Figure 24: Impacts rating of pots as adjusted for conditions in the sablefish fishery (derived from "Shifting Gears" by L. Morgan and R. Chuenpagdee 2003)

I increased both the physical structure and seafloor organisms impact score, because the sablefish pot fishery uses trotlines. The "Shifting Gears reports aggregated both trotline and individually set pots, but notes that trotlines "tend to cause more damage during hauling than single pots." The increase in these two scores reflects this greater potential to cause damage. Also some portion of the pot fishery moves their pots with every set. This distributes the impact of gear to a larger area. It is unclear whether this distributed impact is worse than concentrated impacts for these specific habitats, and so should be a topic of future study. Sablefish pot fishers explained that the extent of habitat impact is directly related to the fisher's skill. Skillful fishermen/women can retrieve that gear by picking it directly off the seafloor. Less skillful fishermen/women will drag the pots off the bottom, causing increased damage.

I decreased the shellfish and crabs bycatch score, because in the sablefish fishery all crabs must be discarded and the bycatch ratio is low (e.g. 0.009 lbs. of tanner crab per every pound of sablefish and 0.001 lbs of Dungeness crab for every pound of sablefish). I also decreased the marine mammal bycatch score, because the Shifting Gears report considered the entanglement of right whales in lobster pots lines. There is no recorded take of marine mammals in the sablefish fishery.

I increased the finfish bycatch impact score, because of the depth at which the sablefish fishery operates. Typically pots allow for live release of fish; but because rockfish have swim bladders, they die upon being brought to the surface. This partially negates the positive benefit of live release that pots often have. Also much of the research considered in the Shifting Gears report took place in warm climates, which facilitates the quick disintegration of rot cords. The deep waters of the sablefish fishery are cooler, so the rot cord will disintegrate more slowly, and so have a greater potential to ghost fish. Also the pots in this fish have only one rot cord, so if a pot becomes partially submerged or encrusted with organisms, the rot cord may be obscured and the pot may begin to ghost fish again.

Gear Modifications to Reduce Bycatch and Habitat Impacts

One of the secondary goals of this study was to seek out technologies or practices that could potentially reduce bycatch and habitat impacts in the sablefish fishery, especially in the trawl fishery. The survey identified three technologies that Dr. Craig Rose of NOAA's Alaska Fisheries Science Center and his colleagues are developing for Alaskan fisheries. These technologies may be of use to the west coast groundfish fishery. Also the survey identified scientific evidence to warrant an interest by fishermen in modifying pots to increase their efficiency and ability to catch a wider range of species. To read about the details of this research, please see Appendix Three.

Perceptions, Pros, and Cons of Gear Switching

In the following section, I summarize how the interviewees defined gear conversion,[13] how they view the pros and cons of gear switching, and any concerns they may have about the subject. When applicable, I include the responses of other stakeholder groups to certain concerns and offer my own analysis of the validity of these concerns. Most of the individuals interviewed for this study are community or industry leaders who are or have been active on state and federal advisory boards, industry groups, or community groups. Thus it is reasonable to assume that they are more knowledgeable

[13] The term "gear switching" was used in the interviews. For the sake of clarity In the report, I use the term "gear conversion" for long-term and/or unidirectional changes in gear, and "gear switching" for bi-directional or unconstrained changes in gear.

than the constituents they represent about potential management options, such as gear conversion. So the views summarized below are likely of a detail and depth beyond that of the average stakeholder.

Trawlers and Affiliates

Pros	Cons
May decrease discards	May increase discards
Will increase business options	Too time consuming to convert vessel
More places to fish	Initial investment too costly
More convenient places to fish	Continued investment not worthwhile
More flexibility in when to go fishing	Not enough potential profit
Increased value of fish	

Table 2: Summary of the pros and cons of gear conversion as opined by the trawling community

Of the trawlers and their affiliates (hereafter referred to as trawlers) that I interviewed, all were aware of the concept of gear conversion or switching. They viewed it as a way to increase their business options, by being able to fish a portion of their sablefish allocation using fixed gear. With this perception the trawlers assumed that gear conversion or switching would occur as part of an individual quota (IQ) system that would guarantee them access to a share of the quota. Many of these trawlers also assumed that the quota would be transferable. With a few exceptions, the trawlers believed that an ideal gear switching system would allow them to move between fixed-gear and trawling fisheries at will. They believed that without this level of freedom, gear switching would not be worth the time and financial investment. In my expert opinion as an interviewer, I believe that this stance was at least in part gamesmanship, trying to establish an advantageous position for future discussions. When pressed for their views on a more restricted gear conversion scenario many agreed that they would at least consider other options.

The exceptions to most common perceptions of gear conversion included those of two small boat trawlers whose fishing operations had been severely restricted by the RCA. Because of these restrictions, trawling had become a much more costly and dangerous endeavor, as they had to travel a much greater distance to reach legal fishing grounds. They were quite interested in gear conversion as a semi-permanent or permanent uni-directional switch. They were willing to switch gear for the length of the two-year management cycle or even longer. In the course of my interviews, I heard rumor of at least one other trawler who might be interested in a permanent gear conversion. Yet another trawler expressed interesting in having his permit bought out as The Nature Conservancy has done in Morro Bay. [14] However, I believe his interest was simply in a profitable means to leave the fishery not in lease-backs as a means of gear switching.

All the trawlers showed a preference for pots rather than longlines as a target for gear conversion. They stated that pots are an easier gear to fish. They perceive that pots

[14] The Nature Conservancy (TNC) has purchased 6 limited entry trawl permits from trawlers based in Morro Bay, CA. In partnership with Environmental Defense, TNC has obtained an experimental fishing permit from PFMC that allows the leasing of most of these permits back to fishermen as fixed-gear permits, within the context of a research protocol.

would allow them more flexibility as to when they fish their gear, because pots can be left unattended—unlike longlines. This is especially attractive to small trawlers who cannot contend with severe weather, which can thus cost them fishing time. However, my interviews with pot fishers reveal that there is a limit to this flexibility. Unattended gear may be lost to weather or gear conflicts. Also, if the gear is left for too long it will yield poor quality fish. Notably, one trawler has purchased a pot permit in order to increase his allowable sablefish catch. He fishes this permit on another boat, so does not practice gear switching, per se. However, he seems quite satisfied with this arrangement as a viable way to catch sablefish.

Only one trawler was not interested in any form of gear conversion. This trawler fished on a boat with a substantial fishing history and so participated in numerous fisheries. In order to pursue these fisheries, he had to change the gear on his boat. By his estimate, he changes fisheries and gear 90% more frequently than other trawlers. Because of this full schedule, he would only have a couple of weeks each year during which he could switch to using pot gear, which would be his preferred gear. The trawler explained that the financial cost and fishing time that he would lose in converting his vessel to operate for such a short time would not be worthwhile for him. He states, unlike all the other trawlers that I spoke to, that he catches his full limit of sablefish while trawling and makes a substantial profit. So for him, increased revenue from gear switching would only come from the increased value of the fish. This potential increase in revenue would not be worthwhile given the initial and recurring investments. In addition to the initial $10,000 investment to buy pots, he estimated that the time to convert the vessel to a pot fishing boat would be 3-7 days and would cost $500 for the price of a crane rental to remove the winch from the boat deck. These same time and financial costs would be repeated when converting the boat back to trawling. For these reasons, he was not interested in gear switching. I believe that he is an exceptional case, both in the history of his boat that allows participation in so many fisheries and his high level of catching success as a trawler. Thus his views, while noteworthy, are probably not representative of most trawlers.

Several trawlers expressed concern that gear switching would result in an increase in discards. This they believed would result from trawlers switching between gears within the same fishing season. Trawlers would be limited in how much of their sablefish allocation they could catch with fixed-gear, because a portion of this allocation must be set aside to account for the sablefish bycatch they will encounter while trawling for Dover sole and thornyhead. If the trawler does not set aside enough sablefish to allow the capture of the full allocation of these other species, the trawler will be forced to discard sablefish in order to catch and retain Dover sole and thornyhead.

When I presented this concern to managers and other trawlers, they discounted it on several points. First, this same problem occurs with the current trip limit system. Trawlers often exceed their trip limit and are placed in a position of discarding some fish in order to catch others. These dissenters believe that in comparison to current discard practices, gear switching as part of an Individual Quota (IQ) program would likely decrease discards. Second, if gear conversion were part of an IQ program, discarding would only occur on the final trip during which one or more of the allocations were exceeded. That is because once a fisherman exceeds his allocation, the fishing season will be over for him/her. Third, an IQ program may include a measure that makes quota holders accountable for any exceedance of their allocation. This would serve as a disincentive to exceed allocations.

It was very difficult to elucidate the basis of the concerns about increased discards. Even with repeated follow-up questions and interviews, the individuals who voiced this opinion had difficulty detailing their concerns. My sense as an interviewer is that perhaps these individuals have a hunch that gear switching may create loopholes that allow or encourage discards or high-grading of fish. This speaks to doubts about the enforceability and structure of a gear switching program. Additionally, the dissenters to the idea of increased discards support their view by pointing to potential structural elements of a gear switching program. Thus, this study was not able to define the true risk of increased discards. However, I can say with certainty that the viability of a gear conversion program will depend heavily on how well the enforcement and accountability mechanisms function.

Pot Fishers and Affiliates

Pros	Cons
More judicious use of the resource	May reduce value of fixed-gear caught fish
May reduce discards	May increase competition for pot fishers
More ecologically sound	Inequitable; pot fishers cannot gear switch
May reduce gear conflicts with trawls	Over-crowding of fishing grounds

Table 3: Summary of the pros and cons of gear conversion as opined by the pot fishing community

Of the pot fishers and their affiliates (hereafter referred to as pot fishers) with whom I spoke, the majority were unfamiliar with the concept of gear conversion. Because they had not previously considered the option, their perceptions of the concept were vague. The few that had some understanding of the concept, knew it only in the context of The Nature Conservancy's efforts in Morro Bay, CA. Thus for the gross majority of the pot fishers, I had to define gear conversion in order to initiate the conversation. Their unfamiliarity with the topic may have affected the depth of their responses.

With the exception of two individuals, the pot fishers believe that there is space in the fishery both geographically and in the amount of sablefish available for the trawlers to convert to other gears. These fishermen did not foresee any conflicts. In fact, several thought that it would be better for the resource, because trawls "waste" so many fish as bycatch. With gear conversion, these previously "wasted" fish would remain in the water to grow, reproduce, and be available for other fishermen/women to catch. Also several interviewees saw an added benefit in that they might lose less pot gear from having it intercepted by trawls. They reasoned that gear conversion would reduce the trawl effort and thus reduce the degree of gear conflict.

Those who objected to gear conversion supported the concept as being a more ecologically sound practice, but were concerned that it would come at a cost to established pot fishers. Specifically, this cost would be the over-crowding of fishing grounds. There may not be enough geographic space for new entrants in the fishery. Even if space is available the increase in gear may also result in an increase of pot gear entangling with each other. The small number of comments on this topic indicates that space may only be an issue for a portion of the pot fishery. Specifically those concerned are from areas where fishing grounds are limited by topography and/or regulations and where the boats are smaller and so cannot travel far to fish. Over-crowding may be further heightened by a tendency of pot fishers to concentrate their fishing during the time when the price of hake—the preferred bait—is lowest. Typically, this is a three month window from June to August, during the seven month fishing season.

Another perceived cost to established pot fishers is a reduction in value of fixed gear caught fish, because trawlers-turned-pot-fishers would flood the market with their fish and drive down prices. In discussions of this concern with other fixed-gear fishermen and processors, they all discounted it. They pointed out that the prices for sablefish are driven by the global market. West Coast caught sablefish is only a small percentage of what is caught globally, so even major changes in the composition of the West Coast sablefish fishing fleet are unlikely to affect prices.

Other concerns centered on fairness. One individual felt that fixed-gear fishermen/women should also have the option of gear switching to another fixed-gear or even trawling, so that they also could increase their business options.[15] Another concern was that pot fisher's stakes in the fishery should be protected and that they should be compensated for the increased competition. One individual offered several mechanisms to protect existing fixed gear fishermen from competition from new entrants. These mechanisms could include season restrictions on the new entrants, such as fishing only during the five months not included in the existing fixed-gear fishing season. Managers could also consider opening restricted areas to be used by the existing fixed-gear fleet only. Another mechanism would be restriction on the amount of gear new entrants may use.

The favored form of compensation was an increase of the fixed-gear industry's allocation of sablefish, preferably to the historical level of 48%. Many of the interviewees were opposed to compensation. Several of the fixed-gear fishermen opined that competition is part of the fishing industry and they did not think that compensation is necessary. Trawlers opposed the idea, because most likely the increase in fixed-gear allocation would come at the expense of the trawl allocation. One manager opposed the idea on the basis that it would be a bad precedent to set, because fish are a public resource and exploiters of this resources should not be compensated for losses as though fish were private property. Notably, if gear switching were to occur—even without an IQ system—it is likely that the program could allow trawlers to bring their portion of the sector allocation with them when they switch to the fixed gear sector. Future research should thoroughly investigate potential negative impacts, especially over- crowding of fishing grounds, of gear switching on the fixed-gear fishery.

Longliners and Their Affiliates

Pros	**Cons**
More judicious use of the resource	Not enough space on fishing grounds
May reduce discards	May not reduce discards
	Less fish to support shoreside infrastructure

[15] Reportedly, PFMC will explore allowing limited-entry fixed gear fishermen to switch from longlines to pots/traps with potential implementation in 2009.

Table 4: Summary of the pros and cons of gear conversion as opined by the longlining community

Like the pot fishers, most of the longliners and their affiliates (hereafter referred to as longliners) with whom I spoke, were unfamiliar with the concept of gear conversion. Because they had not previously considered the option, their perceptions of the concept were vague. Again, the few that had some understanding of the concept, knew it mostly in the context of The Nature Conservancy's efforts in Morro Bay, CA. Thus for the gross majority of the longliners, I had to define gear conversion in order to initiate the conversation. Their unfamiliarity with the topic may have affected the depth of their responses.

In general, longliners were supportive of gear conversion, but less so than pot fishers. Like pot fishers, they thought that it would be a better, less wasteful use of the resource. However, one longliner reasoned that trawlers who are used to a much larger amount of discards may continue these "dirty" fishing practices even with fixed gear. There may be merit to this concern, because the cleanest of fixed-gear results not only from the more selective nature of the gear, but also how it is fished. For example, if a longliner chose not to sort fish on deck rather than at the side of the boat, mortality of discarded fish would likely increase significantly. Because many longliner boats are small and lack deck space, there is an incentive to sort the catch as it is being hauled in. Trawl vessels have more deck space. Feasibly, the catch could be sorted on deck and there would be an incentive to do this because the haul in time could increase and the line could be reset faster.

Unlike pot fishers, several longliners expressed concern about geographic space to accommodate more fixed-gear fishermen/women. This issue may be particularly valid for ports near a non-trawl RCA or which have mostly small vessels that cannot safely travel to distant fishing grounds. Longliners were especially concerned about gear switching resulting in more pot fishers, because it is difficult to set a longline in an area where pots are set as well. Notably, one longliner opposed the idea of gear switching on the basis that it would result in trawlers landing less fish and thus have negative effects on shore-side infrastructure.

Processors

Pros	Cons
Will increase trawlers' business options	Less fish to support shoreside infrastructure
Will increase the supply of fixed-gear quality sablefish	Will reduce supply of flatfish
	May increase competition from small processors
	May result in the loss of skilled workers

Table 5: Summary of the pros and cons of gear conversion as opined by the processing community

Most processors and their affiliates (hereafter referred to as processors) with whom I spoke were familiar with the concept of gear conversion and support it on the basis that it would give trawlers more business options. Their primary concern was guaranteeing that they would have an adequate supply of fish to maintain their workers and meet market demand. As a means of mitigating this problem, one manager suggested that in addition to conversion to fixed-gear, bottom trawlers be allowed to use mid-water trawls. This would potentially increase the amount of whiting available to the processors and offset losses from a reduction in groundfish landings. However the processors also feared that a reduction in the number of trawlers would affect the supply of flatfish, which are not caught in mid-water trawls. Also they thought that an increase in longliners, who often process their own fish onboard their boats, might reduce the processing load available to support their workers. Because the processors assumed that gear conversion would occur in conjunction with an IQ program, a couple of them were concerned that trawlers would start their own processing operation by using their allocation as collateral for a start-up loan. They felt the only way to guarantee their supply of fish would be to have a processor allocation of 10-15%.

Currently flatfish, which make up a significant portion of the fish processors market, can only be commercially caught with trawls. However, the large processors that I spoke to only had 5 or 6 trawlers that regularly supplied them. Given that there are only about 4 large processors on the West Coast, it would seem that a viable flatfish market could still be sustained by just a fraction of the 169 active trawl permits currently operating in the groundfish fishery. In further support of this reasoning, many of the trawlers and processors I spoke to said that the global market for common flatfish such as Dover sole is often flooded, during which times processors do not purchase these fish. This suggests that under the present system processors are often over-supplied with some species by the present trawl fleet.

Regarding the maintenance of workers, I do not believe this will be a significant issue with gear conversion. All the trawlers I spoke to expressed interest in switching to pots, which legally are not allowed to process fish on-board their boats, so the amount of sablefish needing to be processed is likely to remain stable. The standard way to process sablefish is a “J cut” in which the head and the guts of the fish are removed and the rest frozen whole. This is a very simple means of processing fish, which does not require much skill. The most skilled workers in processing plants fillet fish; they frequently process flatfish. Assuming that some portion of the trawl fleet will continue to capture flatfish, it should be possible to maintain the skilled workforce in processing plants.

The trawlers with whom I spoke were divided in their interest in processing their own fish. A couple said that they would consider the option as they would any new business option that might be profitable to them. Others clearly stated that they had no interest in fish processing. No one stated that they would definitely pursue processing if that option was available to them. Based on a conversation with a small-scale processor, I doubt that processing by single fishermen or even cooperatives would be a major challenge to the larger processors, because fisher/processors must divide their time between business responsibilities at sea and on land. Also the money generated by these small processors is more likely to remain in the community, thus benefiting it as a whole.

Concerning a processors’ allocation, most of my interviewees outside of the processing community opposed this idea. Much as with compensation for pot fishermen, a processors’ allocation may be an inappropriate use of a public resource. Allocations to fishermen and women serve as a management tool, but a processor allocation could be viewed as simply protection against competition. While processors present their concerns as being about the welfare of fishing communities, many of the interviewees pointed out that first and foremost processors are trying to preserve their personal interests. Most of the interviewees believed that a realistic gear conversion scenario (i.e. with some trawlers still trawling), would allow fishing communities to continue to operate productively. A determination of the number and distribution of trawlers necessary to supply the flatfish market and help support fishing communities would require a detailed economic analysis beyond the scope of this study. Future research to make this determination should be a priority in any further assessment of gear conversion.

Gear Suppliers

Pros	Cons
	May lose money on unwanted stock
	May not have enough time to supply initial demand
	May reduce overall revenue

Table 6: Summary of the pros and cons of gear conversion as opined by gear suppliers

Most of the gear suppliers I spoke with were unaware of the gear conversion concept. Once explained to them, the majority were neutral in their opinions, because they serve many aspects of the fishing community from trawlers and longliners to fish processors. However, it should be noted that trawl gear is more expensive gear than longlines and most pots are imported, so the gear suppliers definitely have a larger financial dependency on trawls in comparison to other gear types. The gear suppliers' greatest concern is being given adequate advance notice of large-scale gear changes. They forecast that they would need six months to a year to reduce their inventory of obsolete gear and stock sufficient amounts of the newly desired gear. The one net shop owner I spoke with believed that gear conversion would reduce the number of nets that the business sells but was not overly concerned, because the owner believed there would always be a need for trawlers. Also, the number of operating net shops has declined greatly in recent years, so the remaining shops serve a large area and have a healthy demand for their service.

Managers

Pros	Cons
Would reduce overall bycatch	Bycatch of yelloweye and canary rockfish may increase
Trawlers may be able to access full allocation	May impair processors' ability to supply their markets and keep staff employed
Will allow trawl permit holders to access the trawl RCA	May add complexity, difficulty, and expense to the observer program
	Would require a major education program
	May not be politically feasible

Table 7: Summary of the pros and cons of gear conversion as opined by managers

Of the federal and state fisheries managers with whom I spoke, all were aware of the gear conversion. Only one supported the idea outright and most others abstained from offering an opinion on the overall merit of gear conversion. The managers believed that gear conversion would decrease overall bycatch. They also thought it would increase business options for trawlers by allowing them to increase the places they can fish and their ability to catch their full allocation.

However, each also voiced specific concerns about the concept. Several managers mentioned that switching to longline gear could result in increased bycatch of yelloweye and canary rockfish, two overfished species that have often constrained shelf rockfish catches in recent years. The trawl RCA and gear restrictions currently protect these fish from trawls, but the populations still remain vulnerable to longlines, which can access their rocky habitat. An increased use of longlines may put the recovery of these species in jeopardy unless appropriate steps are taken to minimize this bycatch.

One manager, expressed concern that a decrease in trawl-caught fish may impair processors' ability to supply their markets and keep their staff employed. I addressed this concern in the previous "Processors" section. Several managers mentioned that depending on the final format of the gear conversion program, the observer requirements could result in a more complex, more costly, and more difficult-to-implement observer system. I will discuss this concern further in the "Management Scenarios and Incentives" section below. A successful gear conversion program will likely also need an education effort to inform the industry about the new program and assist the learning curve for the new gear. This may require a significant investment of resources. Notably, one manager mentioned that because of the diverse stakeholders and the political power of some of these interests, especially processors, gear switching may not be politically feasible at this time. None of the stakeholder groups, including processors that I interviewed, were uniformly or vehemently against gear conversion. In fact, all of them saw some benefit in it. I believe that all stakeholder groups are open to discussing and negotiating the issue of gear conversion.

Management Scenarios and Incentives

In the following section, I will outline several potential management scenarios for gear conversion. I created these management scenarios based on some of the ideal gear conversion scenarios offered by the interviewees. I then presented these scenarios to other interviewees, especially managers, for their responses. The scenarios detailed below are not an attempt to prescribe potential gear conversion regulations. Rather, it is an attempt to divide the range of gear conversion possibilities into clearly delineated and analyzable categories, which can yield insight into the fuller range of possibilities. I will also discuss incentives that might be helpful to encourage participation in gear conversion. One conclusion emerges clearly from this analysis: the Council and NMFS must define the terms of a gear conversion program in order to achieve desired results.

Permanent Uni-directional Gear Conversion

In this management scenario, trawlers would be offered an opportunity to make a one-time irreversible conversion to either pot or longline gear. In terms of reducing bycatch and habitat impacts, this would likely be the most beneficial scenario, because it would permanently reduce the number of limited-entry trawl permits and likely reduce trawl effort. Notably, it is possible (but unlikely) that under this and all other listed scenarios total fishing effort could increase, for example, if permitted trawlers who are currently inactive decide to switch gears and become active fixed gear fishermen/women.

The permanent uni-directional scenario would be the easiest for the present management and observer system to orchestrate and monitor. It should not require significant additional resources. However, like all the scenarios it could and likely would cause some instability in how the fishery operates. For instance, trawlers who switch gears may relocate to areas that are more conducive to fixed-gear fishing. Initially, it may be difficult for the observer program to predict where fishing effort will be focused and as a result may have logistical issues in placing observers. It may take several years for the instability in fishing operations to even out into a predictable pattern. These logistical issues could be minimized by setting a deadline for trawlers to take advantage of gear conversion, so that trawlers cannot switch during the middle of a fishing season and/or the opportunity to convert to another gear does not remain available indefinitely.

The permanent uni-directional scenario may not be as appealing as other gear conversion options for fishermen/women because it would not substantially increase their fishing flexibility. A permanent uni-directional switch would offer trawlers an additional option of how to fish, but once committed to converting; their flexibility in day-to-day fishing decisions would be reduced. Specifically, based on current market demands, trawlers can attempt to target the most desirable of a range of fish species, while pot fishers can only effectively target sablefish. Because of this lack of flexibility a permanent uni-directional gear conversion may be attractive primarily to trawlers who are severely restricted under the present management system. Such individuals may include small boat trawlers who cannot travel to distant fishing grounds and whose closer fishing areas are restricted by conservation areas or not producing highly marketable fish.

Long-term Uni-directional Gear Conversion

This scenario would offer trawlers the opportunity to convert to pot or longline gear for a multi-year term. This scenario would offer many of the same benefits and raise similar issues as a permanent gear conversion scenario. It should reduce bycatch and habitat impacts by reducing trawl effort. It also may be a more attractive scenario to trawlers because it is not a permanent commitment. Thus, trawlers can make business decisions that are responsive to management and market changes. For example, the current high price for sablefish is driven by the demand for it in Asia; if tastes change or for some other reason the price of sablefish falls, fishermen/women will be able to change their fishing practices on a commensurate time-scale.

The management and observer issues presented by the long-term scenario are much the same as with the permanent gear conversion scenario. However, the repeated opportunity to convert to another gear could result in recurring disturbances in the fishing patterns of the industry, causing logistical problems for the observer program. A two-year commitment term to a gear type would probably be most compatible with the existing two-year management cycle. But a two-year term might create considerable flux in the groundfish fishery and thus be too unpredictable to allow an adequate sampling design. A longer term, such as 5 years, would potentially allow the fishing patterns to stabilize for a few years and thus permit adequate monitoring by the observer program. Sampling design could be less problematic to the extent gear switching occurs as part of an ITQ program with 100% observer coverage.

Pre-declared Bi-directional Gear Switching

In this scenario, trawlers would have the opportunity to switch between trawl and fixed-gear within the same fishing season. Before the beginning of the fishing season, trawlers would be required to declare the portion of their sablefish allocation that they intend to catch with fixed-gear. Thus, this scenario assumes that an IQ program is in place. The pre-declared bi-directional scenario should offer reductions in habitat impact and potentially reductions in bycatch as well. However, bi-directional gear switching is a scenario that caused some interviewees to raise concerns about the potential of increasing discards over the status quo. As previously stated, I believe these concerns are not reflective of an inherent flaw in bi-directional gear switching but rather are rooted in concerns about the potential adequacy of monitoring and enforcement measures.

The current observer and data reporting programs are unlikely to be able to handle this type of management scenario. Both personnel and timely data reporting are lacking. Currently, fishermen/women are required to give the observer program 24 hours of notice before leaving on a fishing trip. A representative of the observer program estimated that under this scenario the observer program would need at least four or five days notice, because gear switching would introduce another degree of complexity that must be considered in observer placement and sampling design. For example, a rise in sablefish prices may trigger trawlers to convert to fixed-gear and relocate from trawling grounds to fixed-gear fishing grounds. Without adequate notice the trawling areas would be overstaffed with observers and the fixed-gear fishing grounds understaffed. This complexity would also place limitations on the fishermen/women, because they would have to abide by their declaration of when and where they intended to fish.

The representative of the observer program with whom I spoke anticipated that under this scenario the number of reporting phone calls from fishermen/women to the observer program would increase to such a level that an additional staff person would be needed to respond to them. Also the current catch reporting procedures are too slow to provide up-to-date information on the industry's fishing activities, thus further limiting the observer program's ability to monitor the total catch. These issues will have to be resolved before an IQ program can be implemented. Given these difficulties and uncertainties, the observer program representative with whom I spoke suggested that 100% observer coverage would be the only option that could guarantee adequate coverage and confirm that fishermen/women are using the declared gear.

Unconstrained gear switching

In this scenario, trawlers would have the opportunity to switch between trawl and fixed-gear within the same fishing season without needing to declare when they planned to switch or how much fish they planned to catch with each gear. Like the pre-declared bi-directional scenario, this scenario assumes that an IQ program is in place. The pros and cons are also similar to the pre-declared bi-directional scenario, but would be more extreme. There would be even more uncertainties to hamper the development of an adequate sample design for an observer program. Also without a declaration process, it will be difficult for enforcement to insure compliance with various RCAs, because fixed-gear and trawl vessels are subject to different RCAs. Thus, in the absence of a method by which to determine what level of monitoring coverage would be effective in such a dynamic system, 100% observer coverage would be the only option that could guarantee adequacy and provide sufficient information for managing the fishery.

Incentives

Incentives are likely to be an important means of stimulating gear conversion and achieving its full potential to reduce bycatch and habitat impacts. Several interviewees proposed incentives for encouraging gear conversion. One is an increase in sablefish catch for trawlers who convert to fixed gear, commensurate with the lower level of that gear's discards. Under the current system, managers set the actual catch limit for each gear sector taking anticipated discards and discard mortality for that sector into account. In effect, they set trip limits by taking a percentage off the top of the quota. Because trawls have more discards than fixed gear, a greater percentage is taken from the top. To create an incentive for conversion, managers could increase the trip limit of a trawler who converts, to reflect the lesser discard and discard mortality rates of fixed gear. Under an IQ program, if trawlers fish their quota with fixed gear, more of that quota is likely to be landed catch and less will be discarded, due to the lower bycatch rates of fixed gear. The catch increase would provide an incentive to fish a trawl allocation with fixed gear, because in doing so trawlers would increase their sablefish catch without increasing total sablefish mortality or affecting someone else's quota. This idea was well received by the fishery managers with whom I spoke. However, one individual pointed out that this incentive program would help decrease bycatch, but did not guarantee a reduction in habitat impacts, thus he proposed an additional incentive program.

This manager reasoned that a reduction in the amount of trawling would not necessarily have a functional reduction in habitat impacts if the remaining trawling occurred over the same geographic area. For example, if a particular area is trawled over 5 times a week rather than 8 times a week, it may not be any healthier. To insure a habitat benefit, he proposed that the trawl RCA increase in conjunction with the decrease in the number of trawlers. The decreasing area available for trawling would also serve as a further incentive for more trawlers to switch to fixed gear. Other managers found this idea interesting, but believed that it or any other major regulatory change would have to be phased in 4 or 5 years after the gear conversion program had begun. They emphasized that it is important to be able to monitor and evaluate each component separately, so they should not be enacted all at once. An alternative version of this idea is to designate areas that are open to non-trawl gear but closed to trawl gear.

Another suggestion was an incentive system that rewards low-impact performance over time, not just the conversion to fixed gear. For example, a portion of the "adaptive management trust" quota could be used to reward those who consistently meet a defined standard of minimal bycatch and/or habitat impact over a year or two, based on observer data. A system like this could encourage trawlers who switch gears to learn the best practices for deploying their new gear, and help address concerns that the ability to minimize habitat impacts from pots, for example, depends on the skill and care of the pot fisher.

Some trawlers may be reluctant to make a long-term commitment to fixed gear due to uncertainties about the economics or other factors. A trial period of one or two years during which a trawler could change his mind could help lower the barriers to gear conversion in any of the longer-term scenarios above. Finally, another possible incentive is low-interest loans to help trawlers who wish to convert purchase fixed gear.

CONCLUSION

Bycatch

This report presents evidence that the inherent bycatch rates of trawls are substantially greater than that of longlines and pots for most groundfish species. Bycatch rates of pots and longlines are quite similar, but there is a consistent trend for the bycatch rates of pots to be the lowest of the three gear types. The most important difference between the bycatch rates of pots and longlines is that longlines have a small bycatch of yelloweye and canary rockfish while pots have none. Given the low population levels of these species, any bycatch, even small levels, is of concern and should be considered in evaluating options for gear conversion. Also, in considering gear switching to longlines, the lack of synthesized data on shark and seabird bycatch in the longline sablefish fishery introduces uncertainty that must be accounted for.

Expert opinion and presented data support that the one species for which pots have a substantially greater bycatch than longline is lingcod. Fishery managers conjecture that this greater bycatch results from a rounder body shape or behavioral characteristics of the fish. If pots are truly more susceptible to rounder-bodied fish, this should also be a consideration in gear conversion. While lingcod are presently considered recovered, they only gained this status in 2005. In addition, there may be other rounder-bodied fish populations that are currently healthy, but could succumb to added fishing pressure if more people switched to pots.

Habitat Impacts

The Shifting Gears study shows that trawls have a substantially greater impact on habitat than do longlines and pots. The study ranked longlines and pots closely, but finds slightly more severe impacts for pots. With the adjustments I made to tailor the pot impact profile to the sablefish fishery, the difference is even greater, with pots having more severe habitat impacts than longlines. The work of Dr. Rose on modified trawl sweeps could potentially reduce the habitat impacts of trawls, but the impact would remain substantially higher than fixed gear. Future research should explore the feasibility of using this gear in the west coast groundfish trawl fishery. An additional useful future study would be a GIS analysis of the types of seafloor habitat in the sablefish fishing area and the concentration of each gear type in each habitat. The study should examine the past and present gear distribution, as well as attempt to forecast the gear distribution under different gear conversion scenarios.

Most Preferable Gear

My research suggests that with appropriate management, conversion to longlines or pots could result in reduced bycatch and habitat damage relative to trawl gear. However, the potential ecological risks and the uncertainties about regulatory capacity to handle them are lower with pots than with longlines. In taking a precautionary approach to yelloweye and canary rockfish bycatch, pots would be the best gear to switch to, especially given trawlers overwhelming preference for pots. On the other hand, while pots have less bycatch than longlines, their habitat impacts are less easily managed. Also, pots may have lasting habitat impacts, but the significance of any such impacts is unknown, and reducing it could require innovation. Furthermore, habitat impact of this gear varies with the skill of the user. If trawlers were to switch to pots, many would likely lack this skill. With only 28 active licensed pot fishers, with varying skill levels, there is only a small pool of expert pot fishers to instruct new pot fishers in how best to use the gear. Also, there is little incentive for experts to teach and for novices to learn as long as reducing habitat impacts does not affect their profit margins. At a minimum, training may need to be required for first time pot fishermen, and escape rings should be mandatory.

Longlines have greater bycatch of some overfished species than pots, but this is directly related to the accessibility of rocky habitat to longlines. Time/area closures with associated gear restrictions have proven to be effective measures to reduce trawling in rocky habitat. Similar measures may be effective for longlines, for example, reconfiguring the non-trawl RCA or closing hot spots for vulnerable species. Also, restricting or prohibiting the use of line-strippers may help further reduce mortality of bycatch, including species of concern such as sharks.

The assessment of this study is that longlines and pots have substantially lower bycatch and habitat impacts than trawls. This is true for most overfished species and for sablefish themselves. Minimizing bycatch mortality of sablefish in addition to that of overfished species is important both because bycatch minimization is required by the Magnuson-Stevens Fishery Conservation and Management Act and because the sablefish population is in the precautionary zone, with a predicted downward trajectory in future years under current conditions in the fishery. The costs of continuing the current distribution of gears, in terms of bycatch and habitat alteration, are high.

Based on the available information, I recommend adoption of policies that allow and encourage trawlers to switch to longlines or pots. In weighing the above uncertainties and concerns—on the basis of bycatch alone—pots may be the preferred conversion target because of the lack of yelloweye and canary rockfish bycatch. Further analysis is warranted—of the tradeoffs, of potential bycatch and habitat impact mitigation measures, and of the adoption of a flexible gear conversion system that could allow fishermen/women to switch to longlines or other hook and line gears if more information supports such changes or if the nature of bycatch problems or other factors change.

Pros and Cons of Gear Conversion

Perceived pros and cons of gear conversion varied widely, both within and between stakeholder groups. However, several motifs repeatedly emerged from interviews. As positive effects of gear conversion, many people mentioned that it would allow for better management of the fish populations by reducing bycatch. Also, they mentioned that gear conversion would allow more business options and flexibility for trawlers. In addition, sablefish caught with fixed gear would reap a higher selling price, and thus likely to be financially workable for trawlers who switch gears. As for potential negative impacts of gear conversion, a repeated message was that with fewer trawlers less flatfish would be caught. The sale and processing of flatfish is currently a substantial component of the groundfish trawl industry. Presently, flatfish can only be effectively caught in trawls, so if some number of trawlers remains active, communities dependent on such operations are more likely to remain viable.

Most Preferable Management Scenario

The findings of this study suggest that the most preferable management scenario would be long-term uni-directional gear conversion. This scenario could be effectively overseen by the current management and observer program infrastructure. An IQ program would not be necessary to implement this scenario, though it could prove to be helpful. This scenario is likely to have a real benefit in reducing bycatch, because trawlers will have to commit to using fixed-gear for several years. Because of the long-term commitment, some trawlers, especially those with high-volume operations, will chose not to switch gears. Their continued landings should allow the processors and other shoreside infrastructure to operate healthily. Future studies should explore in more depth the benefits and impacts of gear conversion scenarios.

Incentives are likely to play an important role in encouraging gear conversion. One promising incentive is to provide trawlers who convert to a cleaner gear with a higher trip limit of sablefish, reflective of the lower bycatch rates of fixed gear (in an IQ program, a larger portion of an individual's quota would likely be landed if caught with fixed gear). Another is to encourage good gear practices in an IQ program by using a portion of the "adaptive management trust" quota to reward those who consistently meet a defined standard of minimal bycatch and/or habitat impact over a period of time. Incentive ideas also include a trial period of a year or two during which trawlers could change their mind before making a long-term conversion, low-interest loans to help purchase new gear, and designating areas that are open to non-trawl gear but closed to trawl gear as the number of trawlers declines. Future studies should examine whether and how incentives should be implemented.

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APPENDIX ONE: SAMPLE POPULATION DEMOGRAPHICS

The categories and numbers below summarize the composition of the sample population. Some categories may sum to more than the total number of 44 people interviewed. In these cases an individual may represent more than one affiliation or was interviewed more than once using different methods. Some sub-categories may not sum to the total of the mother category, because some people who were interviewed were affiliated with the category but not participants themselves.

By State:

- California – 11
- Oregon – 15
- Washington – 18

By Affiliation:

- Environmental NGO – 3
- Trawl – 10 (limited entry – 9, open access – 0)
- Pot – 6 (limited entry – 4, open access – 1)
- Hook & Line – 8 (limited entry – 5, open access – 1)
- Manager/ Government Scientist – 9 (state – 3, federal – 6)
- Processor – 5 (large – 3, small – 1)
- Gear Supplier – 4
- Other – 1 (harbor master)

By Interview Format:

- Face to Face – 29
- Phone – 19
- E-mail – 4

By Interview Type:

- Unstructured – 11
- Semi-structured – 39

APPENDIX TWO: GEAR SWITCHING INTERVIEW QUESTIONS

The survey instrument below was used as a guide not a script for interviews. I changed the phrasing, order, and suite of questions asked to suit the knowledge and comfort level of the interviewee. I directed the follow-up questions to a sub-set of the original sample population in order to elucidate concepts that emerged from the first round of interviews. The interviewees were not shown this document.

General:

1. What do you think that "gear switching" means as a concept?
2. Ideally, what would the best gear switching scenario look like?
3. Is gear switching better suited for some types of target fish, not others?
4. What do you see as the pros and cons of gear switching?
5. Can you think of ways to mitigate the cons?
6. Given this ideal situation are you generally for or against gear switching?
7. Are there gear types—other than longlines and pots—that would be a good target for gear switching?
    a. If so, describe this gear.
    b. Do you know anyone who has or fishes with this gear? If so, who?
8. Ideally, what would be the best design for an IQ program?
9. What do you see as the pros and cons of an IQ program?
10. Can you think of ways to mitigate the cons?
11. Given this ideal design are you generally for or against an IQ program?
12. Are you aware of bycatch reduction devices, either ideas or prototypes that would help reduce the bycatch of trawls, longlines, or pots?
    a. If so, how does this device work?
    b. Who is making and/or using this device?
13. Are you aware of any technologies, techniques or practices that could help reduce the impact of trawls, pots, or longlines on sea floor habitats?
    a. If so, how does this device or practice work?
    b. Who is making and/or using this device?

All Fishermen/women:

1. Tell me about your fishing operation.
    a. Describe your boat and gear?
    b. Do you have a mortgage on your boat (good question, but if people are uncomfortable answering financial questions, drop it)?
    c. How many crew members do you employ?
        i. How long have they worked for you?
        ii. Are they relatives or close friends?
    d. When, where, and for what species do you fish?
    e. What fishing permits and endorsements do you hold?
    f. Where do you sell your fish?
    g. Is your operation profitable?

h. Do you want to remain in fishing for the foreseeable future? Using your present gear type?
i. Do you believe that your vessel and operation is representative of other vessels using the same gear? If not, how do they differ?

2. Have you ever fished with longlines or pots? If so, how would you rate your skill level with this gear?
3. If you were to switch gears would you rather switch to pots, longlines, or another type of gear? Why?
4. What incentives would convince you to switch gears?
5. What resources would you need to ease your transition to a new gear type?
6. What would be reasons why you would not switch gears?
    a. What could be done to mitigate these obstacles?
7. If you were to switch gears how would it affect your fishing operation?
    a. Would it reduce your crew size?
    b. Would it change when, where, and for what species you fish?
    c. Would it change where you sell your fish?
    d. How would it affect your profit?
    e. Would you be able to meet all of your overhead costs? Mortgage? Insurance? Boat maintenance?
    f. Would the cost of conversion be an inhibiting factor?
8. Do you believe that your opinions are representative of other fishermen/women using the same gear type? If not, how do they differ?

Follow-up interview questions:

1. *How many pounds of fish do you catch on average in each tow/set?*
2. *Would increased access into the RCA convince you to switch?*
3. *Do you believe that gear switching may result in increased discards? If so, why?*

<u>Longliners and Pot fishers:</u>

1. How do you feel about trawlers switching gear and joining the fixed gear fishery?
    a. Do you believe that there is enough room (geographically, fish allocation, and market) for trawlers to switch gear?
2. Would you be willing to help newly converted fishermen/women learn how to use the fixed gear properly?
    a. Would you be willing to work with state government, federal, government, Sea Grant, and/or non-profits to do so? If so, which?
3. What would be the most effective way to transition trawlers into the fixed gear fishery?
4. What measures do you believe should be in place to ease the impact of the transition on your business? Would geographic or depth limits on new entrants help?

Follow-up Interview Questions:

1. *Would increased sablefish allocation to you help ease the impact of new entrants into the fishery?*

2. *Would the opportunity to process fish on-board your vessel help ease the impact of new entrants into the fishery?*

Processors:

1. Tell me about your business.
    a. How many people do you employ?
    b. How many of these are seasonal workers?
    c. What are the sources of your fish?
        i. What portion of it comes from trawls, longlines, pots, or imports?
        ii. How many of each type of vessel routinely sells to you?
    d. What products do you produce?
    e. How much does each product contribute to your revenues (general estimate)?
    f. What are the markets for your product?
    g. Do you believe that your business is representative of other processors? If not, how does it differ?
2. How would gear switching in the sablefish fishery affect your business?
    a. What species of fish would you likely receive less of? How much less, if 30% (or even 50%) of sablefish trawls converted to fixed gear?
    b. What species of fish would you likely receive more of? How much more, if (30% of sablefish) trawls converted to fixed gear?
    c. Would there be a change in the quality of fish? If so, how would this affect your revenue?
    d. Would this affect you ability to retain workers?
3. Are there measures that could mitigate negative effects of gear switching?
    a. Increased imports?
    b. A minimum number of trawlers?
    c. Specialty markets?

Gear Suppliers:

1. Tell me about your business.
    a. What types of services do you provide?
    b. How many and what types of vessels do you routinely supply?
    c. Do you believe that your business is representative of other gear suppliers? If not, how does it differ?
2. Do you assist in seasonal conversion of vessels, switching between fisheries? If so, describe this work.
3. In your opinion what percentage of the fleet does their own seasonal conversion and what percentage uses the services or a gear supplier or shipyard?
4. If whole sale gear switching were to occur, what would be the implications for your business?
    a. Would there be enough pots and/or longlining gear readily available? If not, what would need to be done in order to anticipate and meet the need?

   b. Would there be enough skill manpower to assist fishermen/women in the conversion? If not, what would need to be done in order to anticipate and meet the need?

Managers:

1. How is the sablefish fishery currently managed in your state?
2. How many trawlers, longliners, and pot fishers operate out of your state?
3. How much sablefish does each group land respectively?
4. How would the management of the sablefish fishery change under a gear switching scenario?
5. What types of incentives would encourage gear switching?
6. What types of programs do you anticipate needing to ease the transition?
   a. Apparently in pot fishing the ability to minimize damage to the sea bottom by picking up rather than dragging the pots is a learned skill. How will you work to impart this knowledge to newly converted pot fishers?

Follow-up Interview Questions:

1. *Would increasing the sablefish allocation by the difference in discard allowances between trawls and fixed gear be a good incentive to switch gear? Why or why not?*
2. *Would giving a portion of the discard allowance to established fixed gear fishermen/women as compensation for what they might lose from additional competition be a good idea? Why or why not?*
3. *Would the opportunity to process fish on-board their vessels be a good compensation for established fixed gear fishermen/women to offset the costs of additional competition?*
4. *Would increasing the RCA for trawls, but allowing access by fixed gear be a good incentive to switch gears? Why or why not?*
5. *How much personnel, time, and financial resources would be needed to support the infrastructure (observers, enforcement, management) of a gear switching program?*

Ice houses, Fuel stations, other portside infrastructure:

1. Tell me about your business.
   a. What types of services do you provide?
   b. How many and what types of vessels do you routinely supply?
   c. Do you believe that your business is representative of other businesses in your industry? If not, how does it differ?
2. If whole sale gear switching were to occur, what would be the implications for your business?
   a. What would be the positive effects?
   b. What would be the negative effects? How could these be mitigated?

APPENDIX THREE:
GEAR MODIFICATIONS TO REDUCE BYCATCH AND HABITAT IMPACTS

Trawl Groundgear Modification:

The most promising technology was the modification of trawl groundgear used by Bering Sea flatfish trawlers (Rose 2007). In this fishery long “sweeps” connect the net to the trawl doors and are responsible for herding fish into the net (Fig. 25). These sweeps, which can be up to 1500 feet long, account for 90% of the trawl bottom contact. Dr. Rose found that by clustering rubber disks together at 30 foot intervals along the sweeps they could be lifted 3 inches off the seafloor, thus reducing bottom contact by 90% as compared to conventional trawls (Fig. 26).

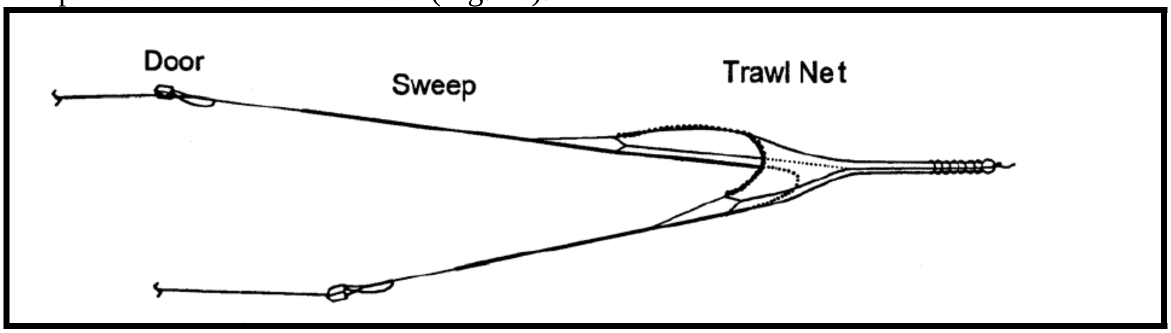

Figure 25: Relative Position of doors, sweeps, and trawl net in an otter trawl system from (from Rose 2007).

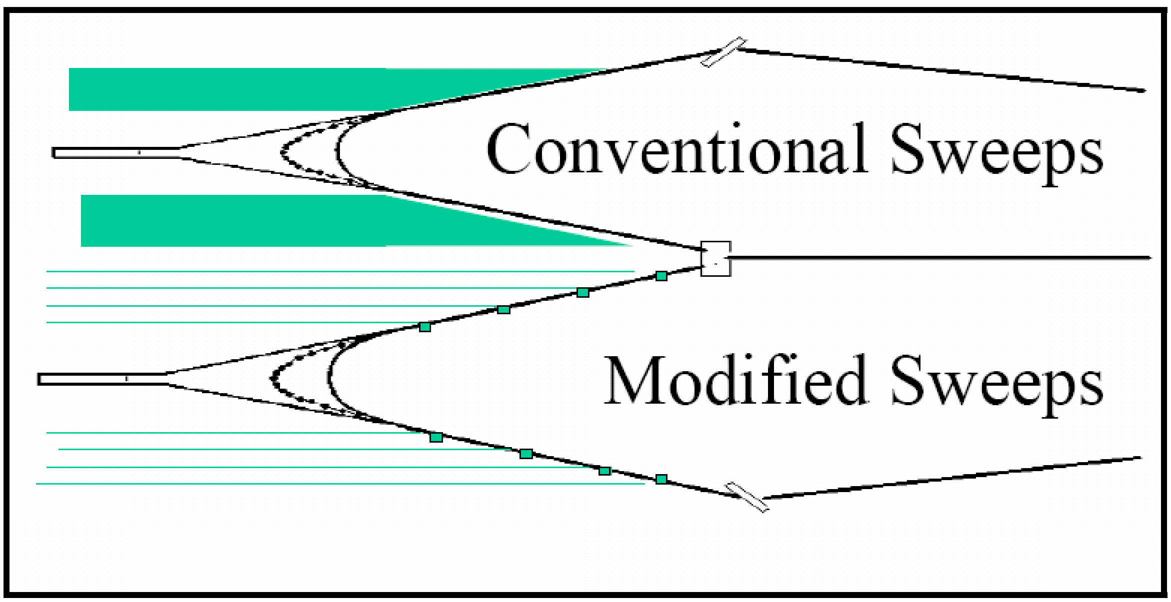

Figure 26: Schematic showing the concept of reducing bottom contact area of sweeps by limiting contact to disk clusters (from Rose 2007)

On soft bottoms, such as sand and mud, this gear significantly reduced the impacts on sessile invertebrates, such as anemones, ascidians, sponge, and basketstars (Fig. 27). These are all low-profile organisms, but flexible organisms, such as sea whips benefited as well (Fig. 28). Although organisms living under the surface of the seafloor were not considered in this study, Dr. Rose conjectured that impacts to these organisms may be reduced by as much as 100%.

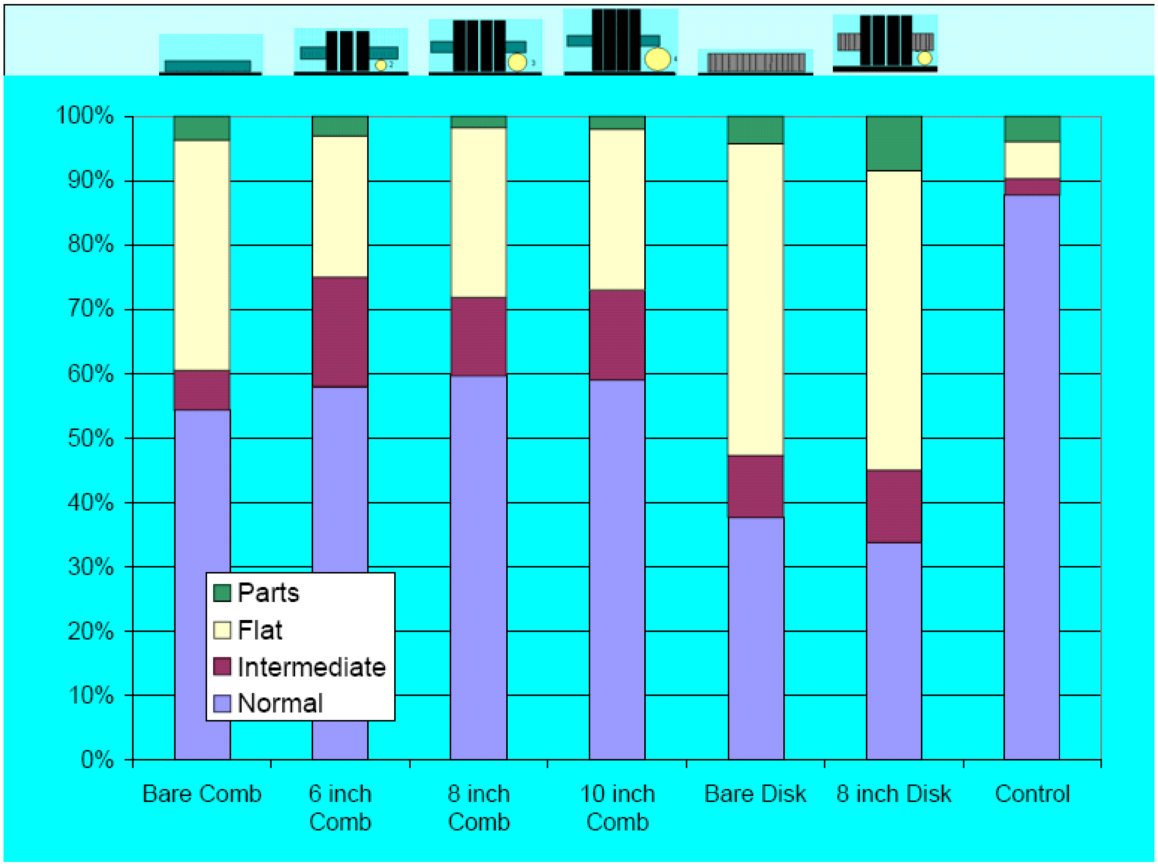

Figure 27: Percent of basketstars in different condition categories after exposure to trawl sweep modifications (from Rose 2007).

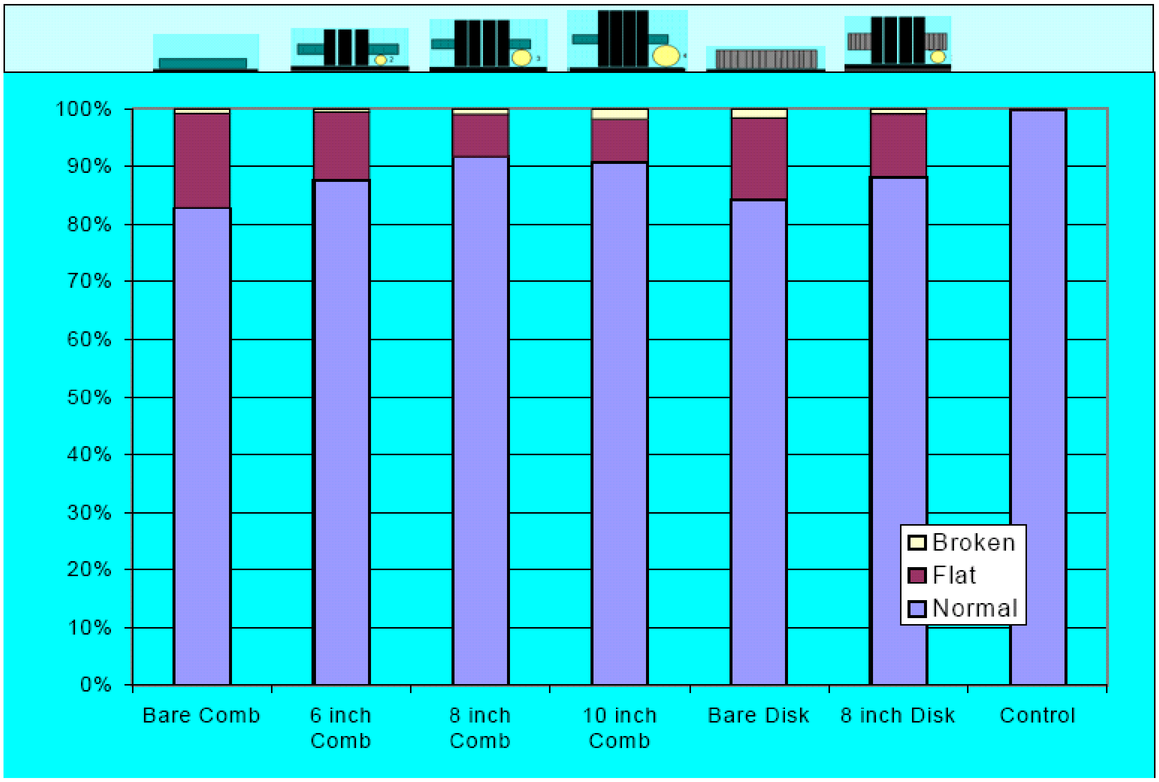

Figure 28: Percent of sea whips in different condition categories after exposure to trawl sweep modifications (from Rose 2007).

The best configuration of this gear involves clusters of 8-inch diameter disks on combination rope (i.e., interwoven cable of steel and fiber). This configuration had no significant change in catch rates for flathead sole, yellowfin sole, rock sole, and arrowtooth flounder in comparison to conventional trawls (Fig. 29) There was also some data suggesting the same may hold true for rex sole and Dover sole, which are species that are also targeted by the west coast groundfish fishery (Rose 2005). The 8-inch disk configuration also had slight increases in the catch rates of roundfish, such as Pacific cod and pollock, in comparison to conventional trawls. In addition, this gear substantially reduced the sediment cloud produced by the trawl, indicating that the cloud may not be necessary to herd fish into the net.

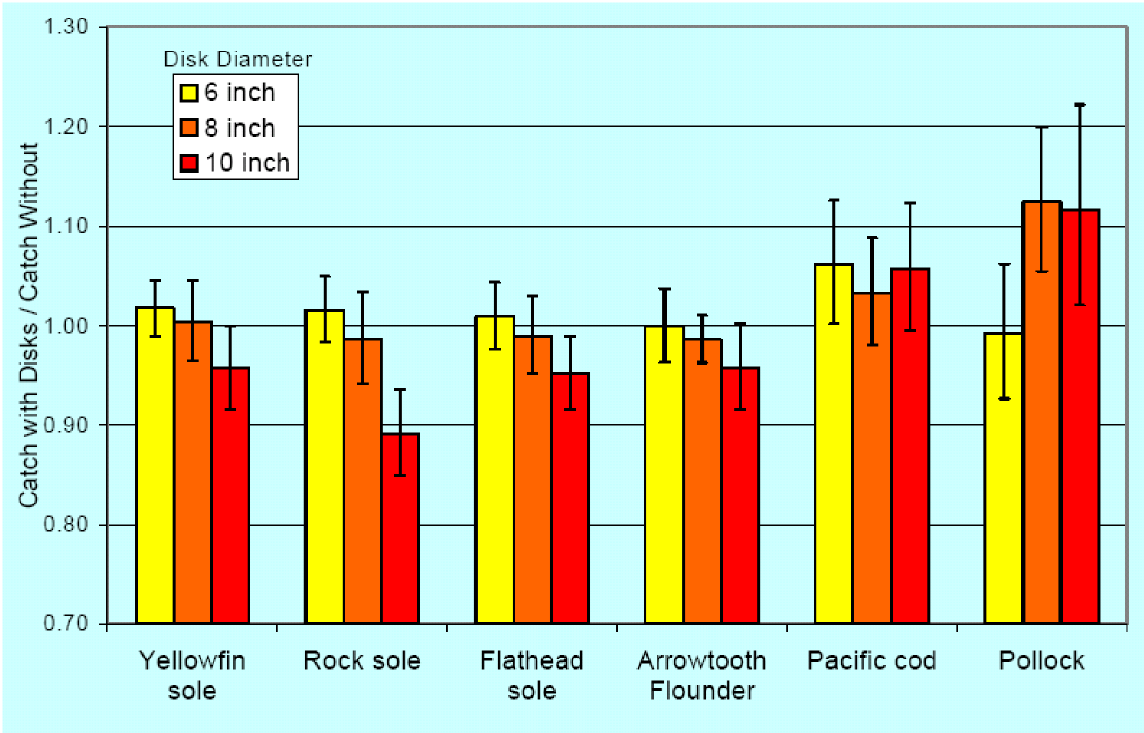

Figure 29: Proportional change in catch rates when trawl sweeps had disk clusters (6, 8 and 10 inch diameters) installed at 30 foot intervals (from Rose 2007)

Dr. Rose is continuing to explore improvements to the groundgear modification. Preliminary tests have shown that the spacing between disk clusters can be increased to 45 feet without causing the sweeps to sag. It may be possible to increase the intervals to 60 feet or even 90 feet, thus further decreasing bottom contact.

Several issues still need to be addressed for the gear to be commercially viable. Most importantly, a means must be found to attach the disks to the net so that they can withstand the rigors of commercial fishing. Also the modified gear works best with boats that are rigged to haul the net onboard using the net reel. The towing blocks that are used on other boats damage the disk clusters. The gear has not been studied at deep depths, where light conditions are low, but day/night studies showed no difference in fish catch. Also the gear has not been studied on extremely soft bottoms. Even with the issues that still need to be addressed, the Alaska Fisheries Management Council is seriously considering the groundgear modification for use by the Bering Sea flatfish fishery.

Dr. Rose tentatively reasoned that the gear may be of value to the west coast groundfish fishery. Because the sweeps are smaller in this fishery, Dr. Rose guessed off-the-cuff that bottom contact may only be decreased by 60%. Also this gear was designed only for used in soft bottom areas, so it could not be used in the rocky areas of the fishery. The groundgear modification should be compatible with any trawl net configuration including the selective flatfish trawl currently being used by a portion of the west coast groundfish fishery.

Halibut Bycatch Reduction Device:

Dr. Rose is also working on a halibut bycatch reduction device for use in the Alaskan cod fishery. Because halibut and cod are well matched in swimming speed and strength, this device takes advantage of the differences in morphology. Halibut are flatfish and cod are round-bodied fish with large heads. The device consists of placing horizontal halibut sized slots in the trawl net. Halibut are able to escape though these slots, but Alaskan cod physically cannot, because of their large heads. This basic principle would hold true for excluding halibut from trawls targeting sablefish. However, because the heads of sablefish are smaller than those of Alaskan cod, additional and likely substantial research would be needed to modify this device for use in the sablefish fishery.

Salmon Bycatch Reduction Device:

Dr. Rose is also developing a device to reduce salmon bycatch in the pollock fishery. This device operates on behavioral differences between the two species. Salmon are stronger swimmers and have a tendency to swim into currents. The device consists of a funnel that directs both cod and pollock toward the codend of the net. Surrounding the funnel are square-meshed escape holes, through which the strong swimming salmon can exit. To increase Pollock retention Dr. Rose has developed a mesh-flap that covers the escape holes until the trawl slows down to a low speed. For this device to work optimally, trawlers would voluntarily have to periodically slow down while trawling. A major problem that needs to be solved with this device is the tendency for the trawl net to tear at the junction of the diamond-mesh of the net’s main body and the square-mesh of the escape holes. The development of this device is worth monitoring; however its usefulness for the sablefish fishery can only be gauged after conducting behavioral studies of sablefish and other target species in the west coast groundfish fishery. Also, the adaptation of this device to the west coast groundfish fishery would likely require extensive gear development and testing.

Pot Modification:

Dr. Rose and Keith Matteson of the Oregon Department of Fish and Wildlife conducted a behavioral study of sablefish approaching baited pots (Rose, Stoner et al. 2005). The study showed pots are extremely inefficient at capturing sablefish. When two pots were left to soak for six hours there were more than 2000 and 5000 approaches of a sablefish in the area of the pots with only 9 and 10 captures, respectively. A single fish likely approached the pot multiple times, highlighting the difficulty of sablefish entering the pot once attracted. This evidence of inefficiency could be a motivating force for the fishing industry and other parties to invest in further developing sablefish pots. Three of the fishermen I interviewed recounted unsuccessful attempts to modify pots to make them more efficient or more able to capture other species, such as flatfish. Each of these interviewees believed that such a design was possible. If a flatfish pot were developed, it would offer an alternative to trawling as a means of capturing commercially important flatfish.

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May 21, 2008

BY EMAIL

Mr. Donald Hansen and Members of the Pacific Fishery Management Council
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Re: Public Comments on Groundfish Trawl Fishery Rationalization

Dear Mr. Hansen and Members of the Pacific Fishery Management Council:

The Pacific Marine Conservation Council (PMCC) respectfully submits these comments regarding rationalization of the west coast groundfish trawl fishery. Although the council is currently considering a trawl-only individual fishing quota (IFQ) system, a well-designed and comprehensive system for the entire groundfish fishery would ultimately improve our stewardship of the resource and preserve community access to west coast groundfish. PMCC envisions a future comprehensive rationalization system that encompasses all commercial fishing effort for groundfish, employs area management for both biological and socio-economic reasons, and includes incentives for effective conservation.

PMCC is focusing considerable attention on area management issues from both the biological and fishing community perspectives. The attached progress report on a white paper under development examines the spatial scales of organization for west coast groundfish biophysics, socio-economics, and management. The report states that spatial structure clearly exists in the California Current System. Many species of groundfish caught in the trawl fishery have spatially complex populations, with the major capes on the west coast (Mendocino, Conception and Blanco) often functioning as significant biogeographic boundaries. PMCC will be co-hosting a workshop in late summer 2008 to develop management alternatives and recommendations.

Provisions for adapting to future geographic splits of species OY and management boundary shifts are appropriately included as features in the current trawl IFQ proposal. **We support the option under consideration to initially use Cape Mendocino as the boundary to subdivide species without an existing geographical subdivision.** This is a logical and informed step, one that should be taken in anticipation of development of additional information on the spatial structure of groundfish stocks.

The following provisions are critical features of an effective trawl IFQ program. PMCC requests that they be reflected in the preferred EIS alternative that the Council identifies.

- **Protect communities and use best available science.** The expectation that management will respond swiftly to the best available science and the needs of communities must be clear. This includes adapting and modifying quota share endorsements from to reflect spatial distribution of fish populations, changes in management boundaries, or subdivisions to preserve community access to the adjacent resource.

- **Reduce bycatch.** Bycatch reduction, specifically avoiding encounters with overfished species, was a central motivation for considering this rationalization. If some overfished species are not managed as IFQ, then the analysis must explicitly demonstrate an incentive to avoid these fish that is measurably superior to the status quo.

- **100% observer coverage.** The system must include 100% observer coverage and as close to real-time tracking of species mortality as possible.

- **Opportunity for a comprehensive quota program.** The system should not have any provisions that would discourage future rationalization of the entire west coast commercial groundfish fishery. In fact this should be anticipated.

- **Evaluate program impacts.** The analysis must explicitly evaluate the potential impacts of implementation upon coastal communities without trawl landings and upon adjacent fisheries, including recreational.

Thank you for considering our comments.

Respectfully submitted,

Peter Huhtala
Director of Government Affairs

PROGRESS REPORT

Matching Spatial Scales of Ecology, Economy, and Management for Groundfish of the U.S. West Coast Marine Ecosystem: A State of the Science Review

A report to the Lenfest Ocean Program at The Pew Charitable Trust

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The following is a progress report on a white paper entitled "Matching Spatial Scales of Ecology, Economy, and Management for Groundfish of the U.S. West Coast Marine Ecosystem: A State of the Science Review." This project is supported by the Lenfest Ocean Program at The Pew Charitable Trust.

This white paper is divided into three sections as follows: 1) synthesize the state of knowledge of scales of organization in the various U.S. west coast groundfish fisheries, 2) identify and prioritize spatial matches and mismatches between various components of the west coast groundfish fishery, and 3) make recommendations for spatial management of west coast groundfish within the context of ecosystem-based fishery management (Field and Francis 2006, Francis et al. 2007, Levin and Lubchenco 2008). In this regard, the paper suggests that spatial management should:

- Consider spatial aspects of interactions between humans and nature (McEvoy 1986,1996)
- Incorporate the capacity for resilience thinking (Walker and Salt 2006),
- Be "second stream" in its approach to both science (interdisciplinary, holistic, focus on understanding rather than prediction) and management (facilitate existing processes and variability, proactive rather than reactive (Francis et al 2007, Holling 1993, Holling and Meffe 1996),
- Employ rules which are as simple as possible in achieving the desired results (Berkes and Berkes in review).

A first draft of section 1, with an internal review, will be completed by June 2008. This draft will be submitted to the Lenfest Ocean Fund and will inform PMCC's Cape to Cape 2 workshop to be held in late summer/early fall 2008.

Section 1 - Scales of Organization – Biophysics, Socio-economics, Management (written and in review)

In this first section (draft completed and in review), we examine spatial scales of organization for west coast groundfish biophysics, socio-economics, and management.

Spatial structure clearly exists throughout the entire area of the California Current Ecosystem (CCS), where a diverse fishing community pursues an equally dynamic and diverse resource; from northern Washington to southern California, from Cape to Cape, from port to port. It can only, briefly, be viewed through snapshots we take in time. These snapshots all reveal clear spatial structure. Unfortunately the clarity is blurred as we pass from one snapshot to another. Space is an elusive moving target. The ocean is constantly in motion, pushed and pulled by winds and tides, agitating away within a basin with a complex bottom structure, creating spatial patterns that morph from year to year, season to season, month to month, day to day…. That's what both fish and fishers face. As a result, diversity ripples through the fishery – different upwelling zones (some separated by deep canyons); different prevalent groundfish assemblages (north and south, inshore and offshore); different fleet structures by state, county and port; different local, state, federal, non-governmental management jurisdictions – some overlapping and some not, a mosaic of diverse activity.

Our analysis reveals how diverse the groundfish fishing communities are as you visit ports dotted from San Diego north to Neah Bay. Fleets have changed over the past several decades, the rise of the offshore domestic hake fleet in the north and of the nearshore live-fish fleet in southern Oregon and California, the declines in overall revenues and the shift in the distribution of revenue between fleets and ports – shifts affected both by changes in the resource and changes in management. So, things are blurry but … they are occasionally, and briefly, clear when taken at certain time scales. What we have reported in this section, generally, is based on, at best, annual observations. But—as is the case with the NMFS survey and its analysis—observations were taken carefully, and at a very fine spatial grid. The following are our major spatial findings:

Biophysics

- **Depth** defines the major axis of west coast groundfish variation (advection and larval transport, metapopulation structure, species assemblages) (Gunderson and Vetter 2006, Gabriel 1982).
- Nearshore demersal habitats tend to be vastly different from deeper offshore areas of the continental shelf and slope. Nearshore regions are typified by "sticky water" with very low alongshore movement (Largier 2003). Offshore regions are generally colder, lower oxygen, and stable ocean environments with much stronger alongshore advective processes coming into play in the pelagic region.
- Metapopulation structures of west coast rocky reef fishes tend to change with depth (Gunderson and Vetter 2006). Broad dispersal and coastwide populations tend to occur offshore (outer shelf and slope). Mesoscale dispersal and populations structured by the capes tend to occur in mid to inner shelf regions. Nearshore populations exhibit very limited dispersal.
- **Latitude** is the second most important factor influencing population and assemblage boundaries (Gabriel 1982). Dynamic atmosphere-ocean processes such as wind stress and current patterns are likely the most important factors controlling these north-south structures. There are two major latitudinal breaks in groundfish biophysics: 1) the turbulent wedge between Capes Blanco and Mendocino – a transition region between north and south which has the strongest upwelling winds and most turbulent coastal flows of the entire CCS (GLOBEC 1994, Peterson et al 2006, Botsford and Lawrence 2002) and 2) Point Conception - the area south of Conception is very different from the area to the north – much smaller local wind stress, warmer subtropical water, different timing in the upwelling season (Hickey 1998).
- Heavy fishing of rocky reef habitats can cause significant changes in **ecosystem structure**. Large piscivorous (rockfish) species have been fished out and replaced by smaller faster growing species. This has been demonstrated at the individual reef scale (Yoklavich et al. 2000), the regional scale (Baskett et al. 2006), and at the coastwide scale (Levin et al. 2006). These spatially explicit ecosystem effects of fishing have not been evenly distributed along the coast and have caused allocation of energy and reproductive potential to shift dramatically and vary from region to region. This has been shown in regional nearshore (O'Farrell and Botsford 2006) and shelf (Harvey et al 2006) ecosystems.

Socio-Economics

In this section we attempted to describe the spatial scales of organization within the groundfish fishery by using PacFIN statistics on landings, revenue and number of vessels by sector. In this summary we categorize by trawl (limited entry, whiting), non-trawl (limited entry, directed open access), recreational and tribal. Focus is on how spatial statistics have changed between 1995 and 2006.

- The whiting trawl fishery is the largest volume fishery on the west coast and primarily lands to ports north of Cape Blanco. Although it is a low value species (price-per-pound), it is landed in such high volume that whiting landings generate high revenues (PSMFC 2007).
- Landings by the limited-entry (LE) non-whiting trawl fishery previously spanned the coast to Point Conception, but currently are concentrated north of Cape Blanco. Due primarily to severe overfishing of shelf rockfish, landings and revenues have declined across the fishery. Flatfish now comprise the majority of landings (PSMFC 2007).
- The non-trawl fishery (LE fixed gear and open access fleets) has maintained its distribution along the entire coastline. Landings have declined but revenues have not changed due to several spatial factors. High-value sablefish dominate landings and revenue north of Cape Mendocino. South of Cape Mendocino, landings have shifted away from shelf rockfish since 1995. From Cape Mendocino to Point Conception, the shift has been inshore to nearshore rockfish supplying the high value live fish market. South of Point Conception, the shift has been offshore to thornyheads (PSMFC 2007).
- The open access fleet has the most participants of any groundfish sector. Over 50% of the open access fleet landings and revenues are in California. Washington and Oregon directed open access fleets are rapidly expanding; their primary target is sablefish (California Department of Fish and Game (CDFG) 2007).
- The recreational sector is largest in California, north of Point Conception, and appears to be increasing coastwide, aside from southern California. Rockfish are the mainstay of the recreational sector, particularly black and other nearshore rockfish (PFMC and NMFS 2006, PFMC 2007).
- Rapid expansion in the tribal fishery conducted in Washington State waters has potential to continue until harvest reaches the maximum allowable harvest allowable under treaty rights (1/2 of harvestable surplus of groundfish available in the usual and accustomed tribal fishing grounds)(PFMC and NMFS 2006).

Management

- **Federal** - The spatial management tools applied to the West Coast groundfish fishery are intended to accomplish a wide range of management objectives. These tools vary greatly in their size, temporal nature and goal. They range from coastwide Rockfish Conservation Areas to species-specific closed areas in the Southern California Bight (cowcod) and off northern Washington (yelloweye rockfish). They also include ecologically important habitat closed areas – 5 off

Washington, 9 off Oregon and 20 off California – and bottom trawl footprint closures designed to prevent the seaward expansion of bottom trawling.

- **California** - The commercial and recreational fisheries for nearshore rockfishes in California are currently managed by Pacific Fishery Management Council (PFMC) in conjunction with the state using three adjacent management areas with the boundaries at Cape Mendocino and Point Conception. California Department of Fish and Game (CDFG) is developing a fishery management plan for nearshore fish (NFMP) species. At this time the NFMP Project identifies four management areas, yet to be fully implemented, with separate harvest guidelines. California is also attempting to apply the concepts of spatial management to state waters through implementation of the Marine Life Protection Act (MLPA) – a series of marine protected areas designed to protect and conserve marine life.
- **Oregon** - The Marine Resources Program of the Oregon Department of Fish and Wildlife is authorized by the State Legislature to administer the regulation, harvest and management of commercial and recreational fisheries in Oregon. The agency uses a variety of tools to manage these fisheries include trip and bag limits, area closures and species- specific management zones. Oregon is undergoing an additional spatially oriented management process through the Governor's office and the Governor's Ocean Policy Advisory Council (OPAC) to develop a network of marine reserves along the Oregon coast to protect the natural diversity and abundance of species that live in each type of habitat in Oregon's Territorial Sea.
- **Washington** - Washington Department of Fish and Wildlife has jurisdiction over fishery resources within state waters (0-3 miles) as well as the inland fisheries of Puget Sound. WDFW employs a variety of management tools for nearshore groundfish. These tools have evolved over time and include area-based management such as the development and implementation of yelloweye rockfish conservation areas in federal waters through the Council process. In 2000, Washington banned all directed commercial harvest of groundfish in state waters.

Note: Sections 2 and 3 have yet to be written and will be the subject of PMCC's Cape-to-Cape 2 workshop to be held during summer 2008.

Section 2 - Matches and Mismatches Between Ecology, Economy and Management (to be written)

This section will attempt to identify spatially explicit matches and mismatches between regional ecosystems, fleets, and management. Section 1 will serve as the basis for the analysis.

Almost two decades ago, and based on the history of California fisheries (McEvoy 1986), the environmental historian Arthur McEvoy presented an innovative, broad and comprehensive context for marine fishery science and management, with a strong emphasis on direct interactions and relationships, of which those occurring within the ecosystem are just a part. Ten years later he built on this experience to define a fishery as an interaction between three variables: an ecosystem, a group of people working (economy), and the system of social control within which the work takes place (management) (McEvoy 1996). His key assertion is that management must equally weigh the many social and economic relationships within the fishery and how, in turn, they both influence and are influenced by marine ecosystem processes and dynamics. In fact it is human interrelationships that are of particular concern to decision makers. What McEvoy (1996) says is that a fishery is a classic example of a social-ecological system (Berkes et al. 2003, Berkes 2004): an integrated concept of humans in nature. And the essence of a sustainable fishery is the health of the interactions between the ecosystem, economy and management (Field and Francis 2006).

Specifically, in Section 2 we ask the question: what are the McEvoy interactions in the west coast groundfish fishery and how are they spatially structured? Based on recent research on sustaining ecosystems and people in a changing world (Walker and Salt 2006), we might rephrase the question as follows: **Can the west coast groundfish fishery be spatially compartmentalized into modules where feedback is tight (economy and ecosystem highly connected) within modules and feedback is loose between modules?** Walker and Salt (2006) indicate that modularity and tightness of feedback are key factors in maintaining general resilience, and that "the degree of modularity in the system allows individual modules to keep functioning when loosely linked modules fail, and the system as a whole has a chance to self-organize and therefore a greater capacity to absorb shocks." Our analysis indicates that the Capes (Blanco, Mendocino, Conception) may provide this kind of modular framework.

Section 3 – Management Alternatives and Recommendations (to be written)

If one looks at the fishery from the McEvoy perspective, then it seems that ecosystem-based fishery management should strive to focus on maintaining or creating healthy interactions between the economy and the ecosystem. We feel that since the effects of fishing are not evenly distributed over space (O'Farrell and botsford 2006, Harvey et al 2006), spatial management could help provide incentives for achieving conservation objectives.

As we state in the introduction to the white paper, "an ecosystem approach to management is management that is adaptive, specified geographically, takes into account ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse social objectives" (Francis et al 2007). This is a management which is proactive and seeks to preserve existing processes and variabilities. This is a management which requires resilience thinking, and its unifying concept of adaptive capacity, through heterogeneity, modularity and tight feedback. If adaptive capacity is at the heart of ecosystem-based fishery management, then spatial management is likely a powerful and essential tool of ecosystem based fishery management. In our case this means making sure that space gets serious consideration in the halls of westcoast groundfish management. It should not be written off just because our view is often blurry.

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May 21, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Re: Amendment 20: Trawl Rationalization Alternatives

Dear Mr. Hansen and Members of the Pacific Fishery Management Council:

Food & Water Watch (FWW) is a national consumer action organization that works to resists corporate consolidation and market control of our food and water. We are, therefore, interested in the developing trawl rationalization alternatives in Amendment 20 for a new regime to manage Pacific groundfish.

As discussed in our previous public comment letter to the PFMC, dated October 30th 2007, we strongly support community-based co-op management rather than a traditional IFQ plan. However, should the PFMC decide to move forward on an IFQ regime for some of the groundfish fishery, we take this opportunity to echo recommendations made at the Groundfish Allocation Committee (GAC) meeting in May, as well as address other particular areas of concern below.

The GAC met on May 13, 2008 in Portland, Oregon and worked hard to develop sound advice regarding the options in Amendment 20. We support their preferred alternatives relating to initial allocation – no initial allocation of harvesting shares to processors and up to 10% of QS set aside for an adaptive management plan.

- Allowing processors initial allocation could lead to a severe shift in market power.

- Including an adaptive management plan provides tools to address unforeseen consequences that are likely to arise from implementing a rationalization plan, as well as to reward those with low bycatch.

We also support the GAC's recommendation for co-ops in the mothership and catcher-processor sectors.

- As public comment indicated at the GAC meeting, co-ops offer peer support and peer pressure to participants, and the pooled bycatch can act as an insurance plan for members.

In addition to the above, we ask the Council to consider very strongly the following suggestions:

- Within the co-ops, we are very concerned about linkages to processors. Much of the language in the co-op alternatives includes a "punishment" for changing processors. This is very troubling. Catchers should be able to freely choose, based on any number of conditions, which processor to use. We urge the Council to select an alternative that does not allow linkages to processors and to develop the co-op plan in such a way that participants leaving the co-op do not trigger a race to fish.

- Term length for shares and permits should be shortened. Having long-lasting term lengths could suggests entitlement (property rights) to the resource instead of privilege. Shorter-term lengths would dispel any confusion that suggests a few people are handed property rights for a public resource, while other community members are left out of the allocation. For this reason, the renewal process should also indicate that qualifying requirements are in place, and that the renewal is not automatic.

- 100% monitoring is highly recommended. This is important to address such things as high bycatch levels and the incentive for high-grading.

- We ask the Council to develop the language regarding gear switching to indicate that only gear switching to cleaner gear is allowed.

- We also ask the Council to support language that would prevent against over-consolidation of the fleet. We acknowledge overcapitalization in the fishery, but are very concerned about the removal of longtime smaller-scale community members from the fleet through this new management regime. Safeguards could be included to protect historic fishermen.

Food & Water Watch continues to champion the community-based relationships that are fostered through co-ops. We do recognize that the Council currently leans toward a partial traditional IFQ program. While we hope co-ops created by private contract will exist under a larger rationalization plan, we have provided recommendations regarding IFQs as well. We respectfully ask that the Council consider our suggestions.

We look forward to working with the Council in implementation of a community-conscious, economically-efficient rationalization plan that will lead to a sustainable Pacific Coast Groundfish Trawl Fishery.

Sincerely,

Katherine Smith
Policy Analyst
Food & Water Watch

FABCAST INCORPORATED
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May 15,2008

Don Hansen
Pacific Fisheries Management Council
7700 N. East Ambassador Place Ste 101
Portland, OR 97220

Dear Don Hansen and Fellow Council Members

I am very concerned about the proposed division of the IFQs for the trawl fish industry.

My family has been in the business of providing construction ,service and repair of commercial fishing equipment and hydraulics on the west coast since 1956. I am the second generation to be involved in this business and have witnessed first hand the changes that have taken place in the fishing industry.

The trawl permit buy back program that was implemented has had a tremendous impact on my customer base forcing me to downsize my business accordingly. The current proposals for IFQs will ,if implemented, have an even greater potential effect on my business.

The fisherman that remained in the Trawl Fleet after the buy back have made a significant investment in time ,vessels and equipment and did so with the understanding that they would have greater yet equal access to the resource in the future .

It is therefore my opinion that the current system of an equal split of the trawl fish quotas be maintained and no IFQs should be implemented. Please allow the buy back program time to increase stocks, as was the purpose of that program , before implementing any further restrictions on equal access to the resource for permit holders.

I am also opposed to any allocation of the trawl fish quota to processors. If they want a portion let them invest in permits and vessels accordingly.

Thank you for your consideration of my opinions.

With Best Regards,

Tom Wilwerding, Pres.
Fabcast, Inc.

Agenda Item F.6.e
Supplemental Public Comment 2
June 2008

Subject: Opposed to IFQ's
From: Kirk Younker <KYounker@pacseafood.com>
Date: Tue, 27 May 2008 11:10:45 -0700
To: pfmc.comments@noaa.gov
CC: Rod Moore <seafood@integra.net>, Craig Urness <CUrness@pacseafood.com>

I oppose the formation of individual quotas. I have participated in the West Coast groundfish industry as a fisherman and then a processor for over 30 years. To change our current system to a derby style fishery owned by a few, in a few select ports will be a misuse of what was once a public resource. Our industry needs a sustainable year around supply of seafood that will be available in all ports to supply year around jobs for coastal communities.

Thank you.

Sincerely

Kirk Younker
Commercial fisherman and now Plant Manager for Pacific Choice Seafood, Eureka CA

Opposed to IFQ's.eml	**Content-Type:**	message/rfc822
	Content-Encoding:	7bit

Hello,

You are receiving this email as you are either directly or indirectly involved in the upcoming decision by the Pacific Fishery Management Council on groundfish and whiting rationalization. Below is a recent news articles and two editorials which outline the situation and the importance of both processors and fishermen being recognized in the initial allocation.

Please visit www.coastaljobs.org for more information.

We appreciate your ongoing support.

May 21, 2008
Seafoodsource.com

Shared-Market System Deserves Consideration

One aspect of today's omnipresent sustainable-seafood movement that often gets short shrift is the sustainability of the industry itself - by that, I mean the fishermen and the processors that make seafood available to us all. Indeed, science should guide fishery-management decisions; but if key stakeholders are eliminated from the process, then we're missing the boat.

During the week of June 9, the Pacific Fishery Management Council will vote to adopt either a shared-market system, similar to what's currently in place, or individual fishing quotas (IFQs) that would allow only owners of government-issued permits to participate in the Pacific whiting and groundfish fisheries. More than 300 stakeholders in the West Coast seafood industry representing more than 3,600 jobs say IFQs, which Alaska has turned to for several of its fisheries with varying degrees of success, would essentially create a monopoly.

The Portland, Ore.-based Coastal Jobs Coalition, comprising industry leaders, restaurant owners and other local businesses, argues that a shared market would protect jobs in coastal communities, guarantee fair access to resources, stabilize prices for consumers and encourage environmental stewardship.

"An individual quota system has the potential to be a great solution for the region's seafood industry, as it can help to manage our natural resources and alleviate the pressure to race for fish. The proposed new rules, however, allow a select group to reap the benefits," says Heather Munro Mann, deputy director of the West Coast Seafood Processors Association. "The rest of the coastal community's stakeholders - from workers in processing plants to restaurants, retailers and consumers - face considerable insecurity."

While researching the Magnuson-Stevens Fishery Conservation and Management Act when it was reauthorized in early 2007, I spoke to Clem Tillion, a hard-nosed Alaskan who was a charter member of the North Pacific Fishery Management Council. Tillion supported IFQs, which were not at all popular when first introduced. One thing he said stuck with me: "The purpose of fisheries is not to provide jobs," he said. "You serve the fishermen best if you keep the resource healthy."

But I also spoke to David Benton, director of the Marine Conservation Alliance in Juneau, Alaska, who told me that a cookie-cutter approach to fishery management isn't the way to go. "One size does not fit all," he said. "Each [plan] needs to be designed and tailored for each individual fishery."

Nothing should prevent the conservation of wild fisheries and jobs within the seafood industry; a healthy balance is essential. If some of the largest West Coast seafood companies and organizations can agree to share access to the resource, then it's a solution that bears a closer look. Come June 9, let's hope the council has done just that.

Thank you,
James Wright
Assistant Editor, SeaFood Business

May 20, 2008
THE COLUMBIAN

Allocation key in fishing

The future of the West Coast seafood industry is at risk. Already anticipating economic devastation from a canceled salmon season, communities may soon receive another blow to jobs and economic security.

During the week of June 9, the Pacific Fishery Management Council will vote on a quota-based system for Pacific whiting and groundfish to manage resources. The Council is considering allocating 100 percent of quota to vessel owners, putting shoreside seafood processors and coastal communities at the mercy of a virtual monopoly. Without decent and reliable access to resources, hundreds of jobs and millions of dollars in investments are at peril.

As president of a seafood processor that has created family-wage jobs in Washington, Oregon and California for more than 75 years, I believe that the only solution is a shared allocation of quota. Fair allocation of resources can preserve the livelihood of fishermen, processors and coastal communities alike.

Jay Bornstein
Astoria, Ore.

MAY 9, 2008
Newport News-Times

Fisheries council needs to make the right choice

Last month, Governor Kulongoski re-affirmed his intent to have no-fishing zones established in state waters. Three weeks ago, the Pacific Fishery Management Council recommended shutting down most salmon fishing in Oregon and California. And within two years, wave energy sites will be popping up on the coast and putting more water off limits to commercial and recreational fishing vessels.

Does this mean we are doomed to eating foreign farm-raised fish while our coastal communities slide into economic decline? Not necessarily, if those who manage our fisheries make the right decisions.

In June, the Pacific Council will decide how our groundfish fishery will look in the future and whether that fishery can sustain commercial and sport fisheries and the coastal communities that rely on them. Central to that decision will be whether and how to divide up fishing privileges. On the one hand, the council can bestow those privileges entirely to commercial fishing vessel permit holders, who can then do with them as they please: favor one community over another by delivering all their catch in one place, or even sell those privileges and retire on the proceeds. On the other hand, the council can take a more balanced approach and distribute some of those privileges to coastal facilities, thereby maintaining jobs and community infrastructure.

At a time when our coastal communities are at risk from other fishery failures and regulatory decisions, we trust that the council will make the right choice by sustaining both our fish stocks and our communities.

Heather Munro Mann
Deputy Director, West Coast Seafood Processors Association
Siletz

Subject:
From:
Ron Hensley <RHensley@pacseafood.com>
Date:
Wed, 28 May 2008 08:11:01 -0700
To:
pfmc.comments@noaa.gov

Dear Mr. Chairman and Council Members:

I oppose the formation of individual quotas. I have participated in the West Coast groundfish industry for 39 years I started as a commercial fisherman in 1969 and now as a processor I am better off under the status quo. Our industry does not need another layer of unknown expense that is based on the hope that a quota system will result in more fish or higher prices. Because of good management practices, the industry will have greater access to fish in the future and our revenues are increasing every year for the last few years.

I also believe that a quota system will create a race for fish where one does not exist today. Because of over-fished species, if fishermen have access to 100% of their allowable catch for the year, they will be highly motivated to get their fish out of the water before being precluded from doing so. Under status quo, we have the same risks of a problem occurring, but the ability for a race is far more limited and it has yet to occur.

A rational alternative is to allow vessels to stack up to two permits and provide quarterly limits. This will lessen the impacts of weather on the ability to land fish. And, at the same time, will achieve the same consolidation as the proposed quota system. This can all occur without the unknown expense and complexity of the proposed quota system.

Please consider my opinion.

Thank you.

Sincerely

Ron Hensley

Ron Hensley

Cell 707-498-1384

Office 707-442-2981 ext 103

May 19, 2008

Pacific Fishery Management Council
Don Hansen, Chair
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

Re: Trawl Rationalization Alternatives – Agenda Item F-6

Dear Chairman Hansen,

I am the manager and captain of the FV Muir Milach. We fish whiting and I want to offer some comments on the trawl IFQ program.

Catch History Years

My primary concern about the catch history years is that whatever they are, when the Council makes its final choice they should be the same for mothership and shoreside whiting (and for groundfish.) It is the same fleet of boats that deliver shoreside and to motherships and would be unfair to use different years for catch history. Using different years is "cherry picking" and will unfairly benefit some boats. (see attached table for an example)

Whatever choice the Council makes for catch history years, it should be "apples and apples." The preferred options selected by the Council at this point should be available in all options. The choice of programs (coop or IFQ) shouldn't hinge on the catch history years.

Coops

The Council should focus on designing a program that doesn't require going back to Congress for additional legislation.

Coops can be a useful tool within an IFQ system, but coops shouldn't be a mechanism to create processor linkages. NOAA GC's memo makes that clear as a legal matter in the shoreside sector, but it is also good policy which should be applied to the mothership sector.

The new MSA requires the Council to "fully analyze alternative program designs, including the allocation of limited access privileges to harvest fish to fishermen and processors working together in regional fishery associations or some other cooperative manner."

The definition of "Regional Fisheries Associations" in the new MSA makes it clear that RFA's must "be a voluntary association among willing parties."

Coops work best when they are voluntary "affinity" based associations, rather than arbitrary groupings based on processor linkages. A straight-forward IFQ system doesn't stop IFQ holders from voluntarily forming cooperatives to deal with bycatch issues or to work cooperatively together with a processor.

Processor Linkages

If the Council is going to include a "coop" option for the mothership sector, it should be one that meets the legal criteria that would apply to shoreside "coops" as a matter of policy.

There are two key features of the mothership "coop" proposal, without which it might as well be an IFQ program:
1- the closed class of processors, and
2- the punitive "non-coop" part of the fishery for vessels that want to change processor linkages.

The un-rationalized "non-coop" pool is nothing more than a means to force involuntary linkages between harvesters and a closed class of processors as the price of rationalization.

The analysis compares the mothership "coop" proposal to AFA coops, but misses key differences.
In the AFA pollock mothership sector there is a closed class of processors, but there are no linkages. If linkages aren't necessary in the AFA mothership sector, why are they necessary for whiting?

In the AFA shoreside pollock sector, processor linkages do exist, but coop formation is contingent on approval by 80% of the vessels, which gives some protection to independent boats. Even with linkages, coops can sell a 10% of their allocation to the processor of their choice. This also provides an alternative way to move between coops without going through an "open access" year.

The mothership processors will have the benefit of a closed class. It is also clear from the analysis that there is substantial vertical integration in the mothership sector.

Even if linkages are necessary, why should it apply to 100% of the harvest? Why not 50%?

Single CV Sector

We support a single CV sector for the trawl IFQ program. Creating artificial firewalls between the shoreside whiting and groundfish sectors doesn't make sense.

Boats that fish whiting may receive a portion of the buyback history, or they may have groundfish quota from their groundfish history. In a single sector, this could offset the need for setting aside a portion of the groundfish OY to support the incidental catch needs of the whiting fishery.

Adaptive Management

I support the inclusion and further analysis of an "adaptive management" part of the program, along the lines of the 10% holdback in the B.C. trawl IFQ program. The B.C. program seems to have been successful in addressing community and processor concerns about potential negative impacts from IFQs.

The analysis needs to be much more specific about this portion of the allocation could be used.

New Entrants

I have a relief skipper who has been with our vessel for many years and operated the vessel in the whiting fishery. There are no provisions for skippers under any of the alternatives. The adaptive management provision could be used to help skippers become stakeholders in a quota share program.

With coops there is no way a skipper can acquire a small amount of quota. To become a quota owner under the coop alternative he would have to purchase the entire history of a vessel. Under an IFQ system a new entrant can buy in gradually.

Thank you for considering my comments.

Captain David Willmore
FV Muir Milach
7858 SE 28th Street A-208
Mercer Island WA 98040

Groundfish Rationalization Catch History Years

The choice of catch history years should be consistent between sectors, whether or not the choice of programs is consistent.

The choice of program type (either IFQ or Coop) should not be influenced by differences in the sets of catch history years between the two program alternatives, nor should the catch history years be determined by the choice of program.

As presently structured, the IFQ alternatives use a longer time series than the Coop alternatives. (1994 to 2003 versus 1997 to 2003). Additionally, some members of the MS sector have advocated using 1998 to 2004 for the MS sector only.

Using different years for different sectors, does not result in "fair and equitable distribution of access privileges in the fishery" among similarly situated persons, as illustrated by the following table.

Catch History Years by **Sector - with** hypothetical vessel histories.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Shoreside IFQ											~~2004~~	~~2005~~	~~2006~~	~~2007~~
MS Coops				???							~~???~~	~~2005~~	~~2006~~	~~2007~~
Vessel 1	MS	MS	MS	MS?	MS	SS	SS	SS	SS	SS	~~SS~~	~~SS~~	~~SS~~	~~SS~~
Vessel 2	SS	SS	SS	SS	SS	MS	MS	MS	MS	MS	~~MS?~~	~~MS~~	~~MS~~	~~MS~~
Vessel 3	SS	SS	SS	SS	SS	MS	MS	MS	MS	-	-	-	-	-

Hypothetical Vessels 1 & 2 each participated in only one sector per year, however each participated every year in either the MS or the SS sector of the whiting fishery. Between 1994 and 2003 both Vessels 1 & 2 participated for 5 years in the MS sector, and 5 years in the SS sector (assume these hypothetical vessels had typical and consistent landings.)

If IFQs are chosen for the Shoreside sector using 1994 to 2003, and Coops are chosen for the MS sector using 1998 to 2004, the allocations to the two vessels would differ radically.

Vessel 1 would get credit for 1 of 7 qualifying years for the MS sector, while Vessel 2 gets credit for 6 out of 7 years.

Vessel 1 would get credit for 5 of 5 qualifying years for the SS sector, and Vessel 2 also gets credit for 5 out of 5 years.

The result is that each vessel gets 50% of a full Shoreside history, but Vessel 1 only gets 14% of a full MS history, while Vessel 2 gets 86%. Vessel 2 gets a windfall as a result of using more recent years for the MS sector relative to the Shoreside sector, while Vessel 1 gets penalized.

1994 through 1997 should be included for all sectors or none.

The desire to include catch history that is more than a decade old should be balanced against recognizing "present participation" and current "dependence" on the fishery."

We don't oppose including history as far back as 1994, though there is little precedent for reaching that far back. However, it is necessary to recognize that "control dates" don't have any regulatory weight, nor are they mentioned in the MSA. What the MSA does say, is that limited access programs must "take into account…" (*among other things*) "present participation…and dependence on the fishery."

A vessel that has participated in, and depended on, the shoreside whiting fishery for the last 10 years, should not lose the last 4 years of that " present participation" if a vessel that hasn't depended on the fishery for 10 years is to get credit for history that older than that.

F.6.e Public Comment

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MAY 3 0 2008
PFMC

Mr. Donald Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Ste 101
Portland, OR 97220

Dear Mr. Hansen:

For the past five years. West Coast Seafood Processors Association (WCSPA) and its members have worked with the Council and its various advisory bodies on advancing a proposal to establish individual quotas for the trawl sector of the Pacific groundfish fishery. As all of those involved know, the effort has been difficult and often contentious. Nevertheless. WCSPA members continued to participate in the effort because they shared the belief that a properly structured quota plan could provide benefits to all parties: fishermen, processors, communities, and the fish stocks themselves.

At its June meeting, the Council will consider a preliminary preferred alternative for a quota plan. In preparation. several Council advisory bodies have met and forwarded recommendations. To date. those recommendations have been disheartening as in some cases they appear to provide economic benefits for only a segment of the many fishery interests and no clear conservation benefit. Making matters worse, we have no idea what the cost will be to implement a program, much less one as complex as some of the recommendations. Most importantly for WCSPA members and the communities in which they reside, the recommendations provide no protection against processor displacement, an issue that has always been central to our concerns. If the Council chooses to adopt these recommendations in their preliminary preferred alternative, we have no choice but to strongly oppose it.

The Council has an opportunity in June to move forward with a program that will provide benefits to all sectors: we hope to be able to work with you in bringing it to final action.

Sincerely.

Frank Dulcich
President

PacificSeafood

Since 1941

June 1, 2008

Mr. Don K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place Suite 101
Portland OR 97220-1384

Dear Mr. Chairmen and Members of the Council:

I recently traveled to South Africa to visit various sardine and ground fish customers. In discussions with CEO's and other top executives of two of the largest Sea Food Corporations in South Africa I was asked about the present effort to institute the West Coast TIQ program. I explained that at this time it appeared that the quota would go entirely to the fishermen and would be allowed to be sold or leased as the fishermen wished without regard for the processors, markets or affected regions. South Africa has had a "Fishing Rights" system for many years. I asked them what would happen if a similar system were put into effect in South. Africa. One CEO replied that it would spell an "absolute disaster" to processors and would spell the end to additional capital investment into the shore side infrastructure. Another said it would be a "ludicrous idea" and would ruin the industry. I found no one there that thought a "Harvester Only" IQ system would work.

If TIQ is controlled entirely by the fishermen the balance of harvest to market forces is lost. In essence the harvest component is the farthest point removed from the consumer and in worst position to understand what dynamics are at work in the market place.

If TIQ is placed entirely in the hands of the fishermen the processors will soon assume the role of custom processors. This will mean the end of shore side investment and attempts to develop methods to add additional value to the product. This is simply because all profit will be aimed toward the fishermen. If monies are diverted to plant investment, market development, and improved employee packages, or for any reason that reduces the income stream to the quota holder or fishermen, the quota holder will simply look for another processor to process their catch.

In this scenario it will not be long before plants will fall into disrepair and skilled workers will seek other work. As this happens the fishermen will look to other

perceived markets such as foreign JV's to prop up their markets. This is already occurring in Canada.

The best uses of this Public resource are those that bring the greatest aggregated value to the entire catch. Measuring ex vessel value is only one component in this equation.
Aggregated Value can be enhanced in several ways: (1) The present market perceives that the present product forms are worth more. (2) New markets are opened which creates greater overall demand for the present product forms. (3) Recoveries can be enhanced through the use of technological innovation or by reengineering processing methodology. This simply means there are more processed pounds to sell, but to accomplish this requires capital improvements. (4) New product forms, such as value added, are developed that bring in greater sales revenues for the resource.
The danger in directing all profit to the fishermen is that incentive is lost for market resource development by the processors. The processor is the industry component that is most closely aligned with the market. They have had to be to survive. Again there will be little or no incentive for custom processors to spend monies on R&D, advertising, or expanding market base as these pose too great a cost risk in juxtaposition to minimal reward. Almost all reward will be passed over to those that control and rent harvest quota.
This is a dangerous economic situation for the overall industry and may well spark a death spiral for processors. Market development will virtually cease. Strategizing for the future will be focused on attempts to cut costs of the commissioned sales forces and custom processors. Long term this is self defeating in achieving the objective of enhanced resource value. Indeed it may well lead to lower ex-vessel revenues and a decrease in market demand.

Pacific Seafood has had a plethora of bad press in the last year. Much of this has been based on the premise that Pacific's success was a derivative of less than ethical business practice. These articles have been so simplistic and inane in nature that it barely deserves comment.
However because it is an insult to all of us that work for Pacific and go to work with the intention of making a positive difference I will make several points:
Contrary to what has been portrayed in the press Pacific is in their present position due to several key components that are never mentioned:
First: Early on, Pacific's management team recognized that the reduction in quotas was either going to lead to a consolidation of industry or a metamorphosis into a boutique fishery. If it had moved to a boutique fishery the shore side infrastructure to handle large harvest volume would have all but disappeared along with most of the present markets.
Second: Pacific chose to invest capital in their plants to modernize and upgrade their systems in order to achieve operational efficiencies, gain recovery, and provide better opportunities for their employees, fleet, and customers.
Third: Pacific's management team was composed of individuals from the coastal communities that strongly believed they needed to dedicate themselves to this task.

This was a huge risk. It would not have been accomplished without hard work, dedication and investment. If Pacific had not stepped up when it had it is likely that the bottom fish industry as we know it would have disappeared. Admit it or not the gross fleet revenues would be much less than present if Pacific had not set out on this mission. To deliberately put our employees, investments, and those years of dedicated effort in harm's way in order to satisfy an ill-conceived, get rich scheme for certain select fishermen is a travesty of fair play. It is patently wrong.

In conclusion: The GAC recommendations should not be enacted. The results will devastate the bottom fish industry and eventually lower the value of the public resource. Some will get a retirement check or an entitlement but at what cost? Better analysis should be done on what really took place in Canada before we consider embarking on a path that attempts to unhinge the present market forces and re-engineer a utopian system that rewards only harvesters. You have only heard some fishermen's stories on what an IQ system given entirely to harvesters will create. These stories are self serving and transparent. You need to look at venues like Canada where Fishermen based IQ has ruined many processors and is fast becoming a debacle.

I will finish with what I heard in South Africa. An Individual Quota system that only rewards harvesters will be a disaster. It is a ludicrous idea that is a recipe for a failure in resource management.

Thank you
Mike Okoniewski
General Manager
Pacific Seafood, Woodland WA Division

F 6

F/V Timmy Boy
Denny Burke
9618 SE Birch St.
South Beach, Or. 97366

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JUN 0 2 2008

PFMC

May 30, 2008

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Or. 97220

To council members & NMFS:

I own and operate the Timmy Boy half of the year. I run the boat for Dungeness crab in the winter and long line Sable fish with traps in June and July. The vessel supports three families plus me with wages 60,000 to 100,000 yearly per family, thus providing all of us a good living. One of our crew runs the boat for trawl ground fish and shrimp the remaining months of the year. This year we plan on catching most of our deep water limits.

We have participated in the trawl fishery from the 1990's to now. We have history in the window years if ITQ's become a reality. Even so I would like to express my concerns and reservations.

My first concern is the cost of implementing and running the program,the added cost of 1,000 dollars per trip for observer coverage and the added cost of 3-5% to run the program. Its just not there.

In the past fuel was 10% of our gross, now in the trawl fishery it is 25%. You add buy back 5%, crew and skipper 42%, ice, unloading, and OTA 4% totaling 76% fixed cost. This leaves the owner with 24% to pay insurance – 26,000 a year, to replace nets, trawl wire and do maintenance on the vessel before he takes any funds home. There are no funds left for any added cost.

My second concern about the program is that I believe when its implemented I will have less access to the fish than I do under the present system. When Sable fish was rationalized I earned a Top Tier and the limits fell from the derby fishery. I'm not advocating derby's, I'm just addressing what they called over head then. Many of the trawl permits now are not participating in the ground fishery. By splitting the buy out history all permits will get equal shares taking 45% of the fish off the table. Once again a fisherman will be forced to write large checks to purchase back fish that was available before. As an example in the Sable fishery I have three permits. I qualified for top tier and purchased a middle and bottom tier for 250,000 so I could fish for four or five trips a

F 6

year. Mark my words the same thing will happen again. A man will be forced to spend money to just stay in the game.

My third concern is the probable consolidation of the fleet. Attending several GAC and ITQ meetings in Portland over the last few years, I heard and read about the caps and probable reduction in the fleet. I'm not convinced such huge change is necessary. What is best for the industry sixty powerful players left standing or the diversity we now have. Tough question!

Last I want to say I was a crewman for fifteen years. Six years in Alaska dragging. I saved and bought a troller in the 1970's. It was a mistake so I sold it went back crewing and bought the Timmy Boy in 1985. Over the last 23 years I have been able to work and buy my way into four fisheries maintaining a decent living. Its still possible but much more expensive to work your way up fishing. ITQ's will make it near impossible.

In the future if you want to trawl, you will either be a corporate employee or be born into a fishing family. Access to the industry will be for the few, the wealthy, and the powerful.

Thank you,

Denny Burke

BOARD OF SUPERVISORS
COUNTY OF HUMBOLDT
825 5TH STREET
EUREKA, CALIFORNIA 95501-1153 PHONE (707) 476-2390 FAX (707) 445-7299

May 27, 2008

Donald K. Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite #101
Portland, Oregon 97229-1384

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JUN 0 2 2008
PFMC

Dear Chairman Hansen:

The Humboldt County Board of Supervisors is deeply concerned that catch history quotas are being considered by the Pacific Fishery Management Council. We believe the current equal access management is acceptable and appropriate.

Our local trawl fleet has complied with all the state and federal regulations. The trawl fleet has been reduced to a number that barely maintains basic harbor infrastructure. Any change in allocation would devastate our fishermen, related businesses and access to local seafood. Selling our fish stocks to other resource investors is not in the best interest of our fishermen or the public.

We respectfully object to any policy that would change the present "equal access" formula. Humboldt County has a long fishing history. Please do not allow the redistribution of resources to other individuals or states.

Sincerely,

Jill Geist, Chair
Humboldt County Board of Supervisors

JG:nlh

Cc: Senator Diane Feinstein
Senator Barbara Boxer
Congressman Mike Thompson
Senator Patricia Wiggins
Assembly Member Patty Berg
California Department of Fish & Game

Gary Ripka
F/V Two Saints
F/V Western Breeze
9667 Yaquina Bay Rd
Newport, OR 97365
(541) 336-4748

May 30, 2008

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

RECEIVED
JUN 0 2 2008
PFMC

Dear Mr. Chairman and Council Members:

I have been working in the West Coast Groundfish industry as a fisherman and permit owner since 1970. I am opposed to the formation of individual quotas.

I feel that the IQ program is probably the end of the trawl fishery. It will be extremely damaging to other fisheries and coast communities. It will give the fishery to a privileged few while take away the livelihood from the rest of the fleet. I see no need for this IQ program because the fish stocks are rebounding while discard rates are lower than they have ever been.

We were promised more fish after the buyback. That has not happened. Instead you charge us with a 5% tax to pay for the buyback and then come up with an IQ program to take the fish away from us and give to a few individuals.

This program will hurt the majority of west cost draggers to make a few people rich. The West Coast boats are the life and blood of the industry. They are the foundation for the port and provide jobs to help pay for the port infrastructure and facilities. This will be one more damaging blow to fishing communities.

From what I have read, most boats are not going to get enough fish to make a living. They will have to buy more fish or else be forced out. This makes no sense to me when the system we have is working.

The fish stocks are improving and the boats are starting to make a decent living. With the boats being forced out of the trawl fishery, they will be forced into other fisheries and this will put pressure on those fisheries so that those fisheries and their families will make less money.

In closing, all I see this program doing is hurting a lot of people so a few can get rich. I hope the council will vote against the IQ program and look at making longer fishing periods so everyone can make a living.

Sincerely,

Gary Ripka, Owner/Operator
F/V Two Saints
F/V Western Breeze

5/28/08
Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RECEIVED
JUN 0 2 2008
PFMC

Dear Chairman Hansen and members of the Pacific Fishery Management Council,

I'm Paul Johnson of M.F.M Seafood in San Francisco, Ca. As a wholesaler and processor of seafood for 30 years I am concerned about maintaining the economic and ecological viability of our fisheries. Although I applaud the PFMC's attempt to bring the Westcoast bottom fishery to sustainability through the use of quota fisheries I don't believe it is wise to grant permanent quotas to a few large processors I believe this would undermine the safety, economic and environmental benefits of an IFQ program. As well, this would stifle competition keeping small, innovative, sustainable minded processors locked out of participating in the market for a publicly owned natural resource.

I am in favor of the Adaptive Management Program option the council is considering. This option will keep the resource and the market open to small innovative companies and help the trawl IFQ program meet vital economic and community goals. By holding back quota to encourage processors and fishermen to enter into business arrangements would keep fish coming into traditional fishing communities, and maintain competition in the industry.

An Adaptive Management Program addresses known concerns, as well as unanticipated impacts. I believe The Adaptive Management Program would ensure the transition to quota system would create tangible benefits for the entire community.

Please oppose permanent IFQ allocation to processors, but support the Adaptive Management quota holdback program in the Council's June preferred alternative.

Sincerely,

Paul Johnson
M.F.M. Seafood
Pier 33 S.F. Ca.

Paul Johnson

Mr. Chairman and Members of the Council

My name is Michael Brown. I am General Manager of Pacific Coast Seafoods Company, and also oversee production at Washington Crab Producers and Bio Oregon, a seafood waste processing company.

These companies provide close to 300 full time positions for various processes. The ground fish fillet operation at the Warrenton facility is likely the largest on the lower West Coast. I have over 30 years experience in filleting ground fish in the Columbia River area. I have witnessed numerous cycles over these years. And in doing so, I have spent considerable time talking to Fisherman and watching current catch per unit of effort.

A lot of emphasis has been placed upon the ground fish disaster that was declared in the year 2000. During the year 2003, the harvesting and processing sectors of this industry did indeed hit rock bottom as pertains to harvestable quota. Through many, including your own efforts, severe restrictions were put into place to protect against depletion of this resource. At the same time, the TIQ thought process became reality with a lot of time, effort, and considerable dollars consumed to analyze such a program. The ground fish "harvesting" sector was deemed to be not economically viable or sustainable.

There is, in my estimation a fundamental flaw and an important piece of all of the analysis's that are being performed. We need to step back and take a look at fish stocks today. Many have rebounded. Some that were placed in the over fished status have rebuilt in fewer years than anticipated. If you look at the potential to harvest ground fish in 2008, verses 2003, there is more than double the capacity to earn on the harvester sector. It appears that beginning in 2009, that there will be even more opportunity to earn in the harvester sector. This is a success story, but that story is not being told.

Some are living in the past, and to do a TIQ program justice, we need to realize and recognize where we are at today. There are vast areas of the West Coast that are restricted from trawling. And the harvesters have changed gear types and their practices in some cases to protect the resource that both the harvester and the processor rely on to do their business and provide employment opportunity for numerous coastal communities. It would be a somewhat simple process to graph the increased opportunity that exists today and perhaps for the future. It is time for those who continue to declare this fishery a "disaster" to face the reality of where we are today, and quit using this non fact-based forum to push a bad decision upon us all.

This system does not need a complete overhaul. What we are using and doing is working. The full development of a TIQ program will take considerable time, dollars, and will push for further consolidation in both the harvester sector, and the processor sector. Many stand to get hurt if this is not done correctly. Many of these people have their entire lives invested in this industry, and deserve the opportunity to be rewarded for having worked through the trying times of the early 2000's.

Thank you for your time.

Sincerely;

Michael L. Brown

Dear Mr. Chairman and Council Members:

I believe I will be better off with individual quotas, being that I am on a company boat with good catch history. I oppose the formation of individual quotas because it will be very unfair for so many people. I have participated in the West Coast groundfish industry as a captain since 1980. I am better off under the status quo. Our industry does not need another layer of unknown expense that is based on the hope that a quota system will result in more fish or higher prices. Because of good management practices, the industry will have greater access to fish in the future and our revenues are increasing every year for the last few years.

I also believe that a quota system will create a race for fish where one does not exist today. Because of over-fished species, if fishermen have access to 100% of their allowable catch for the year, they will be highly motivated to get their fish out of the water before being precluded from doing so. Under status quo, we have the same risks of a problem occurring, but the ability for a race is far more limited and it has yet to occur.

A rational alternative is to allow vessels to stack up to two permits and provide quarterly limits. This will lessen the impacts of weather on the ability to land fish. And, at the same time, will achieve the same consolidation as the proposed quota system. This can all occur without the unknown expense and complexity of the proposed quota system.

Please consider my opinion.

Thank you.

Sincerely

May 30, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fisheries Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Mr. Chairman and Members of the Council,

Last week I plant gave a tour to 30 third grade students, their teacher and several parents of those students. They were fascinated at the processes that go into providing safe seafood products to the consumer. They had no idea of what the plant was all about and how many people that earned a living behind these walls. I can't forget the one comment from one of the mothers who said, "these people are absolute artists in the work that they perform." Yes, they truly are I told her and we would be nothing without them.

It is amazing how many people do not realize just what it takes to process our precious resource from the sea. I fear many here today are equally unaware and perhaps if we could give you all a tour, you too would see just how important we processors are to our communities, fishermen, and employees.

My public comment today is similar to the comments that I provided to the GAC in early May. I mentioned how prior to the Buy Back in 2003 that several boats in Crescent City and Brookings formed a Co-Op and how they went out on their own to become both fishermen and processors. And with the sudden loss of vessels to the processing plants and buying stations in those ports, those processors who were buying groundfish had no choice but to cease operations or certainly curtail them somewhat. The Co-Op shortly after also ceased operations and suddenly there were roughly a dozen vessels looking for markets but the markets, for the most part, were gone. Pacific Choice remained a viable market and began taking back some of the boats that it had lost to the Co-Op. When it became clear that other boats still needed markets, our fishermen were asking us to take on more vessels so their peers would not be without a place to sell their catch. So we did just that. But because we had suddenly lost 9 vessels overnight to the Co-Op, we had also hired on additional boats in other ports to make up for our loss. So when the Co-Op folded, Pacific Choice had more fleet than it knew what to do with and thus, we could not service the fleet adequately. We became a poor market.

So when the Buyback program came into play in 2003, Eureka was hit with a 73% vessel reduction and Crescent City with a 90% vessel reduction. To say the least, those ports were hit hard and the communities suffered greatly. Still today Crescent City and Brookings have no groundfish processing in their ports. In fact, Pacific Choice bought the Ice Plant in Crescent City to support what remaining groundfish and shrimp fleet remained. We maintain it still today, though we have never made a dime doing so.

It has been pointed out to the council that it takes 8 – 12 million pounds of groundfish annually to sustain a viable groundfish operation. Well, with the loss of 31 groundfish vessels at my plant, our operation was clearly in jeopardy. We were without enough fleet to keep our business afloat. Pacific could have easily closed the doors in Eureka but the commitment to the people who made the company outweighed the potential losses that would occur before we could rebuild the fleet and once again be a viable operation. That was our first move towards purchasing fishing vessels in order to provide product to keep Eureka alive. It has taken 5 years since the buy back to rebuild our operation. If this council makes the decision to turn this fishery into 100% IFQ's to only fishermen, my 30 plus years of experience tells me we're done for good. Individual Fishing Quotas must not happen.

This past year the whiting fishery was managed through the Federal Government and the State no longer had any jurisdiction. Prior to this season, early season whiting was to be processed by California processors and the reason for the minimal 5% allocation to an early season in California was to provide shoreside opportunity for job creation when the fishery became Americanized. The season, if it proved productive, would provide for 80 additional positions at my plant alone for roughly 50 days. This year, with a hot market and the fact that Federal Regulations allowed round whiting to be trucked out to Washington and Oregon for processing, we enjoyed 14 production days this year. On any given day there was 30 plus semi trucks running between Crescent City, CA and as far north as Seattle, Washington. Good-bye jobs and good bye to quality products. Hello major fuel consumption, pollution, and inefficiencies. My guess next year's early whiting season will be less than 10 days, and yes, we have to play the game along with everyone else. You might think that IQ's will change that, they will and there won't be a pound of whiting caught, landed or processed in California. That small amount of the quota is part of our life or death.

Things aren't looking so bright for me or my 200 plus employees that have decent wages, heath insurance, 401-k retirement and profit sharing plans are they? And I am only one plant with similar issues. Listen to the fleet that has come down for this meeting and hear what they have to say. Listen to the ones that you have never heard from as well as the same ones you have been hearing from at every council meeting for the past twenty years. I think you will hear a different message. A message that may better represent the majority of the groundfish fleet. And think about the remaining fleets too when making your decision. They will need a place to go and if we are not there and other plants are not there, what justice have we served them? With Fishermen IQ's, this industry will consolidate between Newport, Oregon and Westport, Washington. Groundfish processing and harvesting south of Newport will die.

Like I said, please pay close attention to all public comment today as there are many confused industry participants who do not understand what IFQ's will cost, how much fish they will get, or if they will have to pick up and move to have a place to sell. Processors have been getting out of bed 7 days a week for ever to service our fleets and provide safe seafood products to the consumers. We have built markets that never existed for products that were never desired. We do it year-round and year-round is the only way to maintain the value of this fishery or enhance it. Don't kill us for all the hard work we have put in for most of our lives. IFQ should stand for Industry Fishing Quotas not Individual. Just think of the word and it's connotation. Individualism, selfishness, distinctiveness, egoism, and the pursuit of personal goals rather than collective goals or interests of others. This is the management of the future of our industry? This Council has done a great job recognizing the importance of this Industry for the past twenty years, I certainly trust that you will continue to look at this fishery from the eyes of all of it's participants and continue to make the right decision that will keep us all alive and well. We are all deserving of the access to this public resource. Fish should not be owned by anyone.

Thank you for the opportunity to provide comment.

Sincerely,

Rick Harris
General Manager
Pacific Choice Seafoods
Eureka, CA

Pacific Shrimp Company

213 SW Bay Blvd ▪ P. O. Box 1230 ▪ Newport, OR 97365

(541) 265-4215 ▪ Fax (541) 265-7164

June 2, 2008

Mr. Donald K. Hansen, Chairman
Pacific Fisheries Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Mr. Chairman and members of the council,

My name is Dave Wright and I am general manager of two processing companies: Bandon Pacific in Charleston Oregon, and Pacific Shrimp in Newport Oregon. My family has been in the seafood industry for four generations. If an I.F.Q. program is implemented, I believe it will be the end to an era in my family and many others.

Our fishing stocks are healthier than they've been in years with fewer discards and if an I.F.Q. program is implemented you will have very few winners and considerable losers.

The winners will be large vessels that will enhance their whiting fishery and buy quota from smaller vessels that will not have enough quotas for a sustainable fishery. It will also be a retirement party for others.

The losers will be fishermen with 2008 business plans who lose fishing potential that will force them into other fisheries that don't need more pressure; also processing plants that have invested millions of dollars in infrastructure, equipment, marketing, and people. We have over 250 skilled workers in Newport and Charleston that provide meaningful work that provide decent wages, health insurance, 401-k retirement, profit sharing and vacation pay. I'm sure if you see an I.F.Q. program implemented you would expect to see consolidation in the fleet but you will also see consolidation in the processing sector, loss of jobs and coastal communities will be hurt.

We must change to improve! But the cost to fishermen that are already paying 5% for the "buyback program" is going to be punishing. I understand that the I.F.Q. program could reach 3% and how much more government? Are we looking to change just to change? How many people would buy a car without knowing the cost or how long it would stay on the road?

To change properly in my mind is to have a sustainable fishery that provides meaningful jobs, investment, and a rational approach to our industry. First, we need to change fishing periods from six two-month periods to four three-month periods. This will continue to reduce discards and allow the seafood industry to enhance its business plans. Next we need to go to full retention to account accurately pounds caught and where all products can be utilized and someday eliminate all discards. These alternatives could achieve some of the same goals as this I.F.Q. program is intended to do at a fraction of the cost. This change will take investment that can be done under a balanced and rational approach. Lastly we should invest in accurate science not models that are based on some science and who knows how many assumptions. It can be better.

I.F.Q. is not the answer. This feels like an entitlement program for some fishermen and government that will be harmful to fishermen, processors and communities. I know we've spent a lot of money addressing I.F.Q. but that could be chump change to the millions lost if I.F.Q. is implemented.

Sincerely,

Dave Wright
General Manager
Pacific Shrimp Company
Bandon Pacific, Inc.

Jason Moon
F/V Grumpy J
19711 East Evans Creek Rd
White City, OR 97503
(541) 270-7882

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JUN 0 2 2008

PFMC

May 30, 2008

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Mr. Chairman and Council Members:

I oppose the formation of individual quotas. I have participated in the West Coast groundfish industry as a fisherman since 1997. I am better off under the status quo. Our industry does not need another layer of unknown expense that is based on the hope that a quota system will result in more fish or higher prices. Because of good management practices, the industry will have greater access to fish in the future and our revenues are increasing every year for the last few years.

I also believe that a quota system will create a race for fish where one does not exist today. Because of overfished species, if fishermen have access to 100% of their allowable catch for the year, they will be highly motivated to get their fish out of the water before being precluded from doing so. Under the Status quo, we have the same risks of a problem occurring, but the ability for a race is far more limited and it has yet to occur.

A rational alternative is to allow vessels to stack up to two permits and provide quarterly limits. This will lessen the impacts of weather on the ability to land fish and, at the same time, will achieve the same consolidation as the proposed quota system. This can all occur without the unknown expense and complexity of the proposed quota system.

Please consider my opinion. Thank you.

Sincerely,

Jason Moon

Jason Moon, Captain
F/V Grumpy J

Ben Chestnut
F/V Golden Dolphin
170 NE 69th Place
Newport, OR 97365
(541) 265-8008

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JUN 0 2 2008
PFMC

May 30, 2008

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Mr. Chairman and Council Members:

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Please consider my opinion. Thank you.

Sincerely,

Ben Chestnut

Ben Chestnut, Owner/Operator
F/V Golden Dolphin

Jeff Chestnut
F/V Prospector
P. O. Box 1431
Newport, OR 97365
(541) 336-9130

May 30, 2008

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

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JUN 0 2 2008
PFMC

Dear Mr. Chairman and Council Members:

I oppose the formation of individual quotas. I have participated in the West Coast groundfish industry as a fisherman and permit owner since 1984. I am better off under the status quo. Our industry does not need another layer of unknown expense that is based on the hope that a quota system will result in more fish or higher prices. Because of good management practices, the industry will have greater access to fish in the future and our revenues are increasing every year for the last few years.

I also believe that a quota system will create a race for fish where one does not exist today. Because of overfished species, if fishermen have access to 100% of their allowable catch for the year, they will be highly motivated to get their fish out of the water before being precluded from doing so. Under status quo, we have the same risks of a problem occurring, but the ability for a race is far more limited and it has yet to occur.

A rational alternative is to allow vessels to stack up to two permits and provide quarterly limits. This will lessen the impacts of weather on the ability to land fish and, at the same time, will achieve the same consolidation as the proposed quota system. This can all occur without the unknown expense and complexity of the proposed quota system.

Please consider my opinion. Thank you.

Sincerely,

Jeff Chestnut, Owner/Operator
F/V Prospector

Summary of Form Letters Dated May 27, May 28 and May 30

Following are three letters from processor employees. The Council received multiple copies of each, a total of 276. The table below provides a summary of the number of each version of the letters received and the number of years the employee indicated they had been working in the processing industry.

Number of Years Processing	Date of Letter		
	May 27, 2008	May 28 2008	May 30 2008
1	20	16	17
2	9	8	6
3	9	4	10
4	9	5	11
5	8	5	3
6-10	32	29	6
11-15	15	7	2
16+	6	30	4
Uncertain	4	1	0
Total	112	105	59

PacificSeafood

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Westport, WA
PACIFIC COAST SEAFOODS CO.
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Warrenton, OR
Garibldi, OR
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PACIFIC SHRIMP CO.
Newport, OR
BANDON PACIFIC, INC.
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PACIFIC CHOICE SEAFOOD CO.
Brookings, OR
Crescent City, CA
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San Francisco, CA
LIVE SEAFOOD CO., INC.
Portland, OR
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PACIFIC SEAFOOD CO.
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UTAH
Salt Lake City, UT
NEVADA
Las Vegas, NV
Reno, NV
TEXAS
Houston, TX
San Antonio, TX
SEACLIFF SEAFOODS
TEXAS
Houston, TX
San Antonio, TX
CALIFIORNIA
Los Angeles, CA
JAKE'S FAMOUS
CRAWFISH & SEAFOODS
TRANSPORTATION
PACIFIC GROUP TRANSPORT CO.
BRANDS
Pacific Fresh
Sea Rock
Newport
Jake's Famous Crawfish & Seafoods

May 27, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Mr. Chairman and Members of the Council,

I have been working in the West Coast Groundfish industry as a processing plant worker for 4 years. My family and I depend on shoreside seafood processing for our livelihood. I understand that Individual Fishing Quotas could change the amount of groundfish and whiting coming into the port that I work in and therefore reducing opportunities for work or eliminating jobs in the processing plants completely. I already witnessed a whiting season of only 14 processing days with the allowance of Oregon and Washington processors being able to truck early season whiting away from California processing. It is clear where all of the processing power is along the coast and where the fishing and jobs will end up if you allow individual fishing quotas to happen.

Please, don't give away our jobs. My company provides me with 401-k retirement plans, profit sharing, health insurance and a decent living wage. I oppose the formation of Individual Fishing Quotas.

Sincerely,

Moria Spaulding

www.pacseafood.com

May 28, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Mr. Chairman and Members of the Council

I understand that the Pacific Fishery Management Council will soon be making decisions on an Individual Fishing Quota plan that may directly affect the fishing vessels that deliver their products to the plant that I work at. I have been working as a seafood processor for 10 years, and my family and I are totally reliant on these vessels delivering their products here.

I am also hearing that a there is some consideration to fish only seasonally, so that there may not be full time work available on a year around basis as we have always been accustomed to. This will not work well as I need to work on a full time basis to support my family. The company that I work for provides full benefits, but that may be in jeopardy if we do not continue to have a year around fishery.

I witnessed what occurred with the Groundfish Buy Back program, where overnight, a lot of fishing vessels were gone, and am very fearful that this may happen again.

Please look at a plan that does not take more jobs away from the coastal communities. I do not support any plan that will disrupt or jeopardize my future. I oppose this type of Individual Fishing Quota plan.

Sincerely;

ANDRES JIMENEZ J.

May 30, 2008

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Mr. Chairman and Council Members:

I have been working in the West Coast groundfish industry as a processing plant worker for 22 years. My family and I depend on shoreside seafood processing for our livelihood. I understand that Individual Fishing Quotas could change the amount of groundfish and whiting coming into the port that I work in and therefore reducing opportunities for work or eliminating jobs in the processing plants completely.

Please don't give away our jobs. My company provides me with a decent living wage, 401-K retirement plan, profit sharing and health insurance. I oppose the formation of Individual Fishing quotas.

Thank you for considering my opinion.

Sincerely,

May 28 letter from individuals participating as a fisherman/crew-member: 8 letters, example follows.

First year of participation

1979
1986
1988
1992
1992
1992
2000
2001

May 28, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Mr. Chairman and Members of the Council

I oppose the formation of individual quotas. I have participated in the West Coast groundfish industry as a crew member since 1988. I am better off under the status quo. Our industry does not need another layer of unknown expense that is based on the hope that a quota system will result in more fish or higher prices. Because of good management practices, the industry will have greater access to fish in the future and our revenues are increasing every year for the last few years.

I also believe that a quota system will create a race for fish where one does not exist today. Because of over-fished species, if fishermen have access to 100% of their allowable catch for the year, they will be highly motivated to get their fish out of the water before being precluded from doing so. Under status quo, we have the same risks of a problem occurring, but the ability for a race is far more limited and it has yet to occur.

A rational alternative is to allow vessels to stack up to two permits and provide quarterly limits. This will lessen the impacts of weather on the ability to land fish. And, at the same time, will achieve the same consolidation as the proposed quota system. This can all occur without the unknown expense and complexity of the proposed quota system.

Please consider my opinion.

Thank you.

Sincerely,
M Bowers

May 28 letter from individuals participating in various modes, including fisherman, crewmember, processor employee, customer and supplier: 4 letters, example follows.

First year of participation

1977
1979
1985
1992

May 28, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Mr. Chairman and Council Members:

I have been involved in the West Coast groundfish industry as a ________ fisherman, permit owner, crew member, processor employee, customer, supplier since 1977. My business does not need another layer of unknown expense and complexity that will come with the proposed quota plan.

Availability of targeted species is increasing because of good management practices by this Council. As a result, It is clear to me that a permit owner's available gross revenue will have more than doubled from the year 2000 to the year 2009.

The proposed quota system is complex and adds layers of regulatory burden on an already highly regulated business. This is additional complexity and expense that we do not need.

Thank you.

Sincerely
M. Bowers

Agenda Item F.6.E.
Supplemental Public Comment 3
June 2008

STEVE AARVIK
F/V WINDJAMMER
18316 68TH AVE WEST
LYNNWOOD, WA. 98037
(425) 776-9618

E-mail: oneme5she@comcast.net

PROCESSOR SHARES

NO!

These shares should be given to only the boats doing the fishing. The Processor Boats are owned by corporations. If allowed to receive a "Share" of the assigned quota then this will in affect limit the price paid to the average fishing vessels who are not owned by the Corporation or Processor Boats.

This will create a monopoly which eventually will exclude the little guy, the owner operators of the small fishing vessels who have for the many years maintained, worked sweat equity for the eventual delivery of the fish to the tables of your family and ours.

When you allow the Corporation or the Processor to have a piece of the Fair Market Value then the pie become crumbs. This would create a playing field not equal to all, the supply and demand has shifted and the market structure has changed, so the harvester who take the most risk need to have the flexibility to sell to the highest bidder.

The processor has always had control over the price of getting fish from other countries, buying farmed fish which severely softens the market for us the United States Fisherman. What happens to the small fishing family owned boats they would not have a chance to compete. The industry then like many other conglomerates' for instance, the oil industry which has excluded and eliminated the small service stations. This has created a monopoly that controls the outrageous price for a gallon of gas and the "bonuses" for the corporation executives at the cost of us the general population. The low income, the hard working etc are paying the price at the expense of losing their homes, and lively hood.
How will the family owned businesses survive and not become a dependant of the state. The unemployed with no other options but to become "Wards of the state" so to speak. I am afraid as are many others we will lose our business or livelihood being an independent I want to highlight independent.

The Processors will be in complete control and with the limitations instilled by them will dictate the supply and demand that will cause price increases, price gouging which will cause them to control the value for the same fish and the same season to be affected. My self and many others have invested in the owner/operator fishing vessels and this is what we are trying rationalize to explain the ripple affect to so many owners, to your families and any who want or need to have fish on their dinner table.
The processors must anti up and offer a fair market price to buy our fish and not be allowed to be added into our shares already given from this small piece of the pie.

Another issue of concern that needs to be considered would be the dilution of our well maintained fishing industry off the Washington Coast. When allowances are given to other states fisherman and vessels, it will tap into the resources in which we have worked so hard reasonably manage for the sake of the industry and our futures as Washington State Fisherman. This will limit or possibly eliminate what we have worked so hard to maintain and balance for Washington state fisheries.

Sincerely,

Steve Aarvik
Windjammer Fish Northwest Inc

Agenda Item F.6.E.
Supplemental Public Comment 4
June 2008

STEVE AARVIK
F/V WINDJAMMER
18316 68TH STREET
LYNNWOOD, WA 98037

(425) 776-9618
E-mail: oneme5she@comcast.net

June 6, 2008

To Whom It May Concern:

My name is Steve Aarvik. I am the owner of the Windjammer. I have been the owner/operator for the last 20 plus years. My family and others have been through the changes of the fishing industry. Unfortunately, most of them have been to the detriment of my family and the industry which we have nurtured and preserved for these many years. Our livelihood is now being stripped from the people that have been so committed to the fishery for all of these years. When my family started in the fishing industry we began fishing Rockfish. That was taken away from us, given to other fisherman, Native Americans, to rectify the negative occurrences from years past. Even some of those participants didn't have the years of experience and years of sweat and tears, the building of a family dedicated to the industry since the early 1950's. We have gone through these many changes, paying the taxes, the increase in licensing costs, and changing permit prices. The buy-back program of the trawling fishing boats, allowing them to sell off and come back into the industry in another boat with other licensing, is stealing from those of us who have dedicated our lives and families to this industry. Unfortunately, with this quick but not permanent fix for some, the overall impact is that people like my family are having to pay the consequences of this program. The dividing up of the catch, among the many fishing vessels, allows some participants who may have never fished to now get on the coat tails of those of us who have worked so hard, paying for the appropriate licensing, being a Native to the fishing industry for so many years.

The Windjammer was built in Seattle, and has paid for the licensing, federal and state taxes for all of these years. My family started this at a time when not many were involved or willing to work so hard in order to put food on tables, care for our families, continue to pay taxes, buy permits, and follow the guidelines established in order to partake in this industry. Now there is a proposed buy-back similar to the one in 2004 where the Federal Government is able to collect 1.5% of the initial dollars loaned to those of us who went along with the incentives, paying 5% of our gross revenue in order to repay this "buy-back" option. The questions that need to be asked are why are we funding a buy-back program which allows those who sell the option to get back into fishing vessels, buy new permits, and with new licensing to continue to take more and more of this pie we are sharing, only to deplete the resources even more.

This industry has broken many fishermen and fishing families, and lives have been lost. Those of us who were and still are dedicated, still manage through the changes, and continue to fish to support our families, need to have a sort of protection, a grandfather clause that will allow us to keep fishing and manage our business to allow us to continue to support our families. How can any industry justify that during this recent recession no one will take responsibility for giving 12 cents a pound for fish that used to sell for $1.10 a pound? We still pay for the new permits, pay our taxes, and the rising, with no end in sight, fuel costs. How can we as a people, the Natives to this industry, afford to bring the food to the table of so many? How can we justify allowing some to "double dip", so to speak, to sell off and "re-buy" in order to keep their piece of the dream that so many of us little fishing families have nurtured and worked for all of these years to feed the multitudes? Does our hard work and dedication mean so little to those who have no idea what it takes to support each other in this hazardous at times industry?

We need your help to keep this industry afloat in a fair and committed way for those of us who have worked so hard for these many years. By giving us a grandfather clause or protection from the industry that is going to big boys and buy-backs on the backs of those of us who have worked so hard survive, please give us some recognition for what we have done for so many years. Please support us, the little guys, in this time when so many are going under. To fix this we need your help, including those who agreed years back with the AFA provision signed by Patty Murray and Ted Stevens with precautions, intended to protect us from this type of situation happening again. We need an end to the false promises, and the inability or unwillingness to return our calls and address our concerns when now we are going through the raping and pillaging of the industry that my family and others have worked so hard to appreciate, nurture, and develop in order to place food on the plates of the families all over the globe.

With the ever-changing requirements, new licenses and a third party deciding who can fish, how much a vessel is allowed to fish is determined regardless of the dedication to the industry of the vessel owners, such as my family and others who have been fishermen for these many years. The powers that make these decisions should take into consideration those of us who are Native to the industry, who started fishing years back, through the changes and regulations, the taxes, and the federal requirements. The thousands of dollars we spend with insuring the safety and well being of our crew, the purchasing of supplies to provide for our crew, and our fuel expenditures that pay taxes, keep other industries surviving.

There needs to be some type of monitoring or accountability to those who participate in the "Buy-Back" who may be "double dipping" after completion of the "Buy-Back". They then may purchase other licenses and vessels which allow them to pursue the same fishing opportunities. How can this be permitted, when the Processors as well as the other industry participants who manage to sell and then buy other licenses can start back where they left off? After they sell their interests and then are allowed to take a second piece of this smaller pie that so many have to share, those of us like my family have been involved and doing the back-breaking, yet honest way of doing business, for all these years are subjected to ever-increasing hardship. This creates a larger issue, the monopolizing of the industry and creating antitrust-like problems in this business that so many have built to provide for our families. At times I am struggling to survive or preserve the livelihood of my family for these many years.

Please take steps to protect the small, long-time fishermen and their families.

Sincerely,

Steve Aarvik

#349/Aarvik.lt

Agenda Item F.6.e
Supplemental Public Comment 5
June 2008

The Seattle Times

Finding a system that sustains the Pacific groundfish fishery

By Slade Gorton
Special to The Times

IN the next few days or weeks, an important decision will be made that will affect the future of West Coast fisheries — the selection of the preferred design for an individual fishing quota (IFQ) program for Pacific groundfish (e.g., rockfish, sole, flounder, halibut, cod, whiting).

The Pacific groundfish fishery was declared a federal disaster in the year 2000, but since that time, great progress has been made in forging a path toward sustainability for this troubled fishery.

The Pacific Fishery Management Council — the federal body charged with managing West Coast fisheries — is on the cusp of an important advance in fisheries management. If done right, its approach can serve as a model for fisheries nationally and globally. The stakes are high.

More than a decade ago, while serving as a United States senator from Washington state, I was intimately involved in legislative negotiations over the desirability of IFQs as a fisheries-management tool. IFQs are important new tools to manage fishing efforts (who fishes and how much they are entitled to catch).

The basic idea behind an IFQ is simple. Under an IFQ program, each fisherman is allocated a percentage of the total allowable catch, established by the government every year, to harvest annually. Fishermen can then choose to go fishing when and where it makes the most sense — considering things like market conditions, weather, safety and even family obligations.

This new system makes more sense than arbitrary fishing "open seasons," which set off a short, frenzied "race for fish" — a race whose timing cannot take into account market conditions, fishing conditions or family obligations.

IFQs replace the historical "race for fish" with a much-more-sensible "race for value," whereby fishermen go fishing when the value of the product is highest in the marketplace — and they fish in ways that will leave the oceans productive for the next season. If the oceans are healthy and there are more fish, fishermen can get the benefit. When designed properly, IFQs hold enormous promise for improving the economic health of fishing communities and the overall health of the oceans. Everyone benefits.

During debate in 1996, Congress agreed to a moratorium on new IFQ programs while additional review of the issue was undertaken by the nation's top science authority, the National Academy of Sciences (NAS). The NAS study confirmed that IFQs can be a valuable option for fisheries management. In the intervening years, use of IFQs has grown internationally. Studies have shown the benefits of such programs in improving economic performance, reducing environmental damage and increasing fishing safety.

Like all management tools, IFQs must be implemented responsibly. The details of the program design matter. Certain conditions must be placed on IFQs to avoid potential adverse effects. Initial quota allocations are often among the most difficult decisions made by councils, with some claiming that the fish processors — as opposed to the fishermen — should get a substantial allocation.

With many others, I have serious reservations about allocating quota shares to fish processors. The NAS echoed these concerns in its study, finding that "if regional councils determine that processors may be unacceptably disadvantaged by an IFQ program because of changes in the policy or management structure, there are means ... for mitigating these impacts without resorting to the allocation of [quota share to processors]."

The Pacific Council's proposed IFQ management program is one of the most sophisticated in the nation — affecting nearly 82 species of fish. Some of these stocks are currently in sore need of rebuilding. The council has spent years analyzing the options for implementing this IFQ program.

The Pacific Council faces an important opportunity to make significant strides in reforming the management of the West Coast groundfish fishery in its meeting next week. It should proceed purposefully toward a strong IFQ program.

The council should support the excellent recommendations from all three affected states — Washington, Oregon and California — to shun the initial allocation of quota to the processing sector as unnecessary and as loaded with potential unintended consequences.

In addition, the council should retain some fishing quota to smooth the transition to IFQs for fishermen and processors and communities, all of whom depend on a healthy and vibrant fishery. Done properly, the decisions of the council will serve as a model for other fisheries around the world.

Slade Gorton spent 18 years representing Washington state in the United States Senate, where he was an advocate for IFQs. He is currently with K&L Gates, which represents various fishing and conservation interests.

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City of Morro Bay
HARBOR DEPARTMENT
1275 Embarcadero
Morro Bay, CA 93442
Ph. 805-772-6254
Fax: 805-772-6258

June 3, 2008

Mr. Donald K Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador PL Suite 101
Portland OR 97220-1384

RE: SUPPORT FOR THE ADAPTIVE MANAGEMENT PROGRAM (A-3 IN THE ALTERNATIVES DOCUMENT FOR TRAWL IFQ) AND THE GEAR SWITCHING OPTION SHOULD THE PFMC ADOPT TRAWL INDIVIDUAL FISHING QUOTAS

Morro Bay is a small coastal harbor with a long and rich history in fishing. While we have many home ported fishing businesses here that range all over the coast, our landings that support local marine dependent infrastructure (fuel dock, ice plants, bait operations, marine mechanics and services) have consisted substantially of ground fish from abundant local grounds. We are committed to trying to retain our fishing heritage and businesses and are concerned that should a trawl Individual Fishing Quota (IFQ) program be adopted, small ports like ours will see further erosion in landings and effort through market consolidation or unanticipated impacts.

We recognize that an individual quota program is likely to be implemented. We urge the Pacific Fishery Management Council (PFMC) to support the Adaptive Management Program in consideration of trawl IFQ to preserve flexibility in implementing IFQ's so as not to destroy small fishing harbor infrastructure. No matter how long we study the issues, unanticipated impacts will arise, and the adaptive management program is the best method for the PFMC to make a commitment to local communities.

In addition, a gear switching option will help the program produce significant economic and conservation benefits by enabling fishermen to maximize landing of target species while minimizing by catch of over fished/highly regulated species.

Please include adaptive management and gear switching in the PFMC's June preferred alternative because those components are vital to the trawl IFQ programs ability to meet important social, economic and ecological objectives.

Rick Algert
Harbor Director

RA/sl

cc: Mayor and City Council

U:\CORRESPONDENCE\2008\PFMC 6-3-08.doc

Accumulation Limits

Peter Leipzig
Fishermen's Marketing Association
June 10, 2008

The PFMC's Groundfish Allocation Committee (GAC) and Groundfish Trawl Individual Quota Committee (TIQC) met May 13-15, 2008 and May 15-16, 2008, respectively.

The GAC reviewed issues and alternative in the IFQ program with the purpose of developing a recommendation to the PFMC on preferred alternatives for selection at the June 2008 meeting of the PFMC. The TIQC focused on issues that the GAC did not have time to discuss. One of the issues the TIQC developed recommendations on was that of the establishment of Accumulation Limits and their relationship to the possibility of a "Grandfather clause" within the program. Grandfather provisions generally provide exemptions to individuals from restrictions such as Accumulation limits.

At the TIQC meeting, I made a proposal on how to establish the Accumulation Limits and to not provide for a Grandfather clause. This proposal was accepted by the full committee and is reported in the TIQC report Agenda Item F.6.d TIQC Report, June 2008. Following the TIQC meeting, I drafted a statement laying out the rationale for the proposal and submitted it to the members of the GAC. My explanation follows:

Accumulation Limits and Control Dates

The establishment of accumulation caps is something that must be done in the IFQ program. This is important to: 1) ensure that quota is distributed and remain in the hands of relatively many individuals, and 2) satisfy the Magnuson Act requirement that there are not excessive shares being held by any single entity.

The IFQ committee proposed that accumulation caps (or control caps) be established as the greatest percentage of catch, for any entity, that occurred during the window period for each species where quota will be issued. The window period is the time frame that will be used to determine catch history in calculating quota shares. The IFQ committee further recommended that in calculating the greatest catch for any entity, that the ownership arrangements that existed on the control date (suggested using January 1, 2004) should be used to define "entity" for the purpose of this calculation.

The IFQ committee also recommended that there not be exceptions to the accumulation limits through mechanisms such as a "grandfather clause". This is critical because exceptions would create two classes of entities within the program. Most people would be limited in accumulation to the establish cap levels while the other class would be allowed to exceed these caps. Since many entities in this program will be corporations, the opportunities for "grandfather" exceptions to expire are very limited. Ownership of shares would remain within a corporation even after the death of corporate owners.

Additionally, since quota shares will be issued to the current owner of permits when the program is implemented, it is impossible to know what level of accumulation will exist on January 1, 2010. If individuals know that they will be provided a grandfather exception 18 months from now, there would likely be an effort to further acquire permits in advance of the implementation date; thus threatening the goal of ensuring wide distribution of shares and preventing excessive share ownership.

When the development of this program began the Council set a "control date" and NMFS published this in the Federal Register. This control date put the world on notice that activities after this date may not qualify for the issuance of quota shares. If any entity has acquired trawl permits, after the control date, in an attempt to increase quota share holdings on the date of issuance and these holdings are greater than the accumulation limits, they should not be "grand fathered" into this program. They were on notice that this would not count. Anyone that did engage in this behavior either was not paying attention to the business or was gambling that some exception would be provided. In either case they should not be rewarded now with an exception to the accumulation rule that the vast majority of permit holders must live with.

One last detail, the IFQ committee recommended that **if** the Council were to choose to set the accumulation limits at levels lower than those recommended by the IFQ committee, the allocation should be made with a limited time grand fathering to allow the entity to divest the holdings that would be in excess of the Council's approved level but only up to the amount recommended by the IFQ committee.

The IFQ committee recommended setting the accumulation limit at the maximum that any one entity actually had caught. So if the Council were to set the accumulation limit at some low level, then it is possible that someone would exceed this limit at the out set of the program. This is a very different situation than described above where an individual may have ignored the control date warning. In this case the individual simply caught more fish during the window period than the Council believes is good for the industry.

If this situation were to occur, then it is important for the integrity of the program that the initial allocation made not exceed the maximum percentage realized by any one entity during the window period. In other words, the grand fathering only applies to the amount over the level approved by the Council and up to the maximum that any one entity actually had caught during the window.

Resource stuffing can not be rewarded.

Peter Leipzig
June 1, 2008

e
ENVIRONMENTAL DEFENSE FUND
finding the ways that work

June 10, 2008

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Re: West Coast Groundfish Individual Fishing Quota Program: Critical elements for a preferred alternative

Dear Chairman Hansen:

We want to thank the Pacific Fishery Management Council and staff for the significant time and resources they have devoted to developing an IFQ program for the groundfish trawl fishery. We are aware that this has been a complex and time consuming task, but we are hopeful that once implemented, a well-designed program will not only provide significant ecological, economic and social benefits, but will also be much less time intensive than current management measures. Environmental Defense Fund sees this program as tremendously important for both the benefits it will offer to fishermen, processors, consumers and the resource, and also for its value as a model for other IFQ programs around the country. We are committed to assisting this process in any way we can and welcome guidance from the Council and staff on the most constructive way to help achieve a successful outcome.

With the June preferred alternative vote on an IFQ program the Pacific Fishery Management Council stands on the brink of a momentous opportunity. This program provides the chance to reduce wasteful discards and contribute to rebuilding overfished stocks, while offering the potential to substantially increase the value generated for resource users, communities, and ultimately the nation. But achieving that outcome relies on the right program design. Several program options will have a significant bearing on the ultimate success or failure of the program, and a number of other decision points likewise will alter the ability of the program to protect the resource or generate additional revenue. We have therefore prepared the following set of recommendations for the program elements we feel are an essential part of any preferred alternative the Council adopts in June.

The Council should not be dissuaded from adopting a preferred alternative that will create a strong, precedent-setting IFQ program for the West Coast groundfish fishery

Before discussing our specific recommendations on program design we wish to reiterate our ardent support for the program in general. As you are well aware, the Council made the decision to pursue IFQ management because it recognized that traditional management measures were incapable of solving certain persistent problems in the fishery. In particular, the Council recognized that despite a major federal buyback, the fishery remained both economically and ecologically unsustainable. There are simply too many boats with no direct incentive to avoid sensitive rebuilding species. Although fishery managers have done an admirable job trying to balance the needs of rebuilding stocks while simultaneously providing stakeholders with maximum harvest opportunities, tools such as trip limits – vital to retain year-round landings under the current system – actually exacerbate discards.

In contrast, an IFQ system will provide fishermen the flexibility to maintain year-round landings, and the incentives to avoid sensitive stocks. It will enable fishermen to take better advantage of available yields for abundant stocks and it will inject individual accountability into the system. Ultimately, an IFQ program will facilitate the transformation of the groundfish fishery into a model of economic and ecological sustainability.

The fact that some stakeholders may be against the program (at least initially) or that others have reversed their earlier support because they may not receive an allocation is not an appropriate justification for veering from this necessary reform. It is to be expected that support will not be unanimous, and that some fishermen and processors may oppose the program. But just as happened in British Columbia after the adoption of an IFQ for their multi-species groundfish fishery, we firmly believe that all stakeholders will soon realize that an IFQ system is far superior to traditional management. This may be a case where fishery managers need to lead some stakeholders for the benefit of the entire fishery. And the level of benefits the program provides will depend in large part on the specific components the Council includes in its preferred alternative.

Use the Adaptive Management Program to mitigate processor impacts (if any) from the transition to IFQ management

Initial allocation of quota is undoubtedly one of the most contentious aspects of the groundfish IFQ program. Both fishermen and processors have raised concerns about the potential for quota allocation to unfairly augment the market power of one group over the other. Environmental Defense Fund believes that the program should avoid any deliberate attempt to benefit harvesters over processors or vice versa. We believe that this issue should be dealt with fairly for all parties involved. We also believe the issue should be evaluated empirically rather than on speculation.

Processors have articulated three primary concerns as justifications for a permanent allocation of quota. First, they argue that changing the management regime could devalue the investments they have made to process trawl-caught groundfish under current management rules (the "stranded" capital argument). Second, they argue that IFQs could change fish landing patterns and disrupt the flow of product into existing plants or force plant managers to pay more to fishermen to avoid that result. The concern implicit in this argument is that there will be a shift in marketing power away from processors reducing processing margins. The third justification has been that an initial allocation to processors is necessary to protect coastal jobs and communities. While all of these may be valid concerns, a permanent quota allocation is not the appropriate tool to address them for several reasons.

The stranded capital argument does not justify a permanent allocation of quota because it is not yet clear what amount of capital, if any, will be stranded as a result of the transition to IFQ management. In fact, a recent paper by Dr. James Wilen concluded that because most capital in the processing sector is malleable the amount of capital that will ultimately be stranded in the processing sector is minimal. Even more importantly, the paper concluded that the value of the quota the processors are seeking is close to $100 million, while the value of potential stranded asset claims remain speculative at best and will not emerge until several years after the program is implemented. To grant a permanent right for a speculative problem is poor public policy. If the Council feels that stranded assets are likely to exist and should be compensated, then instead of granting a permanent quota allocation it should dedicate adaptive management quota pounds to processors for a period of years to compensate for documented losses traceable to the transition to IFQ management.

The argument for an initial allocation based on access to fish suffers from similar deficiencies. While we recognize that continued access to fish at prices that allow processors to maintain adequate processing margins is a valid concern, we question whether the processor's proposal for a 25% non-whiting allocation and a 50% whiting allocation are necessary to maintain product flow, especially since processors will already control roughly 12% of non-whiting and 15% of whiting based on permit ownership. A 2008 study of six IFQ fisheries from British Columbia suggests that while ex-vessel prices paid to fishermen have increased, so too have processing margins.[1] Rather than maintaining product flow, a significant initial allocation to processors is much more likely to grant processors a significant market advantage. Moreover, because an allocation to processors will be based on processing history, it will disproportionately assist a handful of large processors, possibly adding to the already considerable consolidation in the processing sector. A more sensible solution is the adaptive management program. We suggest that the Council assuage processor fears about access to fish and exorbitant ex-vessel prices by granting adaptive management quota pounds to harvesters who sign mutually agreeable preseason delivery agreements with processors.

Likewise, predicating a permanent allocation to processors on protecting coastal jobs and communities is lacking as nothing would prevent processors from moving groundfish quota out of a community or closing a plant. Plants have closed before at the expense of coastal jobs, and nothing about processor allocation would prevent it from happening again. If the Council believes some communities might be especially vulnerable to shifting landing patterns and decides it wants to protect those communities, a better solution would be to grant adaptive management quota pounds to fishermen who agree to deliver their catch to those communities.[2]

EDF supports the GAC recommendation that there be no intial allocation to processors. We share their concern that an initial allocation to processors is not the appropriate remedy for possible impacts on communities or in the processing sector. We feel that it may undermine the goals of the program as well as the National Standards contained in the Magnuson-Stevens Act because it would give a handful of large entities excessive control. Specifically, National Standard 4(C) discussing allocation of fishing privileges[3] provides that allocation be "carried out in such manner that no particular individual, corporation, or other entity acquires an excessive

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[1] Economic Impacts of ITQ Fisheries in Pacific Canada, prepared for Canada Department of Fisheries and Oceans by G.S. Gislason and Assoc., March 2008, p. 32. The estimated processed value of the groundfish trawl fishery without IFQs for 2005 is $34 million. The 2005 value with IFQs was $84 million. Even without an initial allocation to processors, harvesters and processors roughly split the additional $50 million in resource rents.

[2] In fact, based on the council's preliminary analysis and discussions with stakeholders, we drafted a strawman proposal that would use adaptive management quota pounds to create incentives to land fish in vulnerable communities and in plants where fishermen have landed fish previously. This could address concerns about impacts of an IFQ program on communities and it would also help processors maintain product flow. For complete details, please see the proposal attached to this document.

[3] While the National Standard language refers to allocation among "fishermen", given that processors are seeking harvesting quota shares they must be included within that class. However, the fact hat processors were not included in this provision suggests that Congress did not intend processors to be eligible for "fishing privileges".

share of such privileges."[4] The fact that some large processors may already need to have their existing shares grandfathered in[5] suggests that a significant initial allocation to those same entities based on processing history would result in excessive shares. Likewise, National Standard 5 and TIQ Program Constraints and Guiding Principles 4 both aim to avoid changing the marketing power balance between harvesters and processors. An allocation such that a fisherman would need access to processor quota just to have enough fish to make a living would transform fishermen into near indentured servants leaving fishermen with almost no bargaining power at all. An initial allocation to processors would be arbitrary and detrimental to the goals of the program as a whole.

Unlike an initial allocation to processors which could increase consolidation and marketing power in the processing sector, the adaptive management holdback is capable of addressing valid processor concerns without drastically upsetting the functionality of the program. The Council will not have to guess what amount of quota shares should be dedicated to processors to meet speculative concerns. Instead, by using the adaptive management program, the Council will be able to direct quota pounds to specific communities, processing plants, or companies, or encourage fishermen to partner with specific plants or companies in order to keep processors whole.

Set accumulation caps high enough to protect historical participation and investments without fostering excessive control

It is important that accumulation caps be set high enough to allow for appropriate while also ensuing that the entire fishery does not end up concentrated in too few hands. Initial analysis predicts potential consolidation under IFQ management to a fleet of 40-60 boats after rationalization. It is important that the Council envision what size fleet would best meet social as well as economic goals and choose accumulation caps accordingly.

Should the Council decide grandfathering would result in an unacceptable consolidation of quota, we support a limited duration grandfather clause to allow entities with quota in excess of the accumulation caps an opportunity to divest that quota.

Full accountability through 100% monitoring is vital to the success of the program

Conservation and economic benefits will be directly tied to the fleet's ability to avoid fish, specifically overfished and prohibited species. The only way to create incentives to avoid those species and to verify that they are being avoided is with a monitoring system based on full accountability. A monitoring program ensures that fishermen stay within their individual catch limits or cover overages in the allotted time by acquiring quota from other fishermen, and it ensures that the fleet as a whole does not exceed its allocation. A monitoring program also

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[4] Magnuson-Stevens Fishery Conservation and Management Act, §301(a)(4)(C).

[5] As discussed above, processing companies will already be allocated roughly 12% of non-whiting groundfish and 15% of whiting based on permit ownership. As the highest own/control cap is 3% groundfish in aggregate, a grandfather clause will be required to allow several processing companies to receive the quota they are eligible for even in the absence of an allocation to processors. No individual fishermen however, is likely to be over the own/control cap, so from the outset there will be a special class of large processors that have an advantage over every other fisherman and processor in the fishery. Any additional quota to processors cannot help but upset the market balance and will also make it nearly impossible for new processing entities to enter the business.

allows fishermen to make the best possible decisions for themselves and the resource. Without full accountability, fishery managers will have no choice but to continue to rely on fleet-wide byctach rates which will prevent fishermen from accessing their full allotment of healthy target stocks, which is one of the primary incentives to fish cleanly and avoid overfished species.

We recognize that 100% monitoring will be expensive, but feel that it will pay for itself in the long run by enabling fishermen to access healthy target stocks and by making the fishery sustainable for the long term. We are open to helping the Council explore creative ways to fund full accountability and suggest looking into privatizing one or more elements of the program.

A 10% carryover provides needed flexibility

Environmental Defense Fund supports a 10% carryover provision. Experience in British Columbia suggests that a carryover provision can reduce total landings because it eliminates the incentive to fish to the limit each year in order to avoid a "forfeit" of the uncaught quota. Instead, fishermen have the flexibility to catch that fish the next year eliminating a mini-race against the clock at the end of the year to maximize landings which could have negative safety and conservation implications.

Overfished species should not be allocated in the same manner as non-overfished species

Allocating overfished species using the same formula as for non-overfished species could make the cost of acquiring quota for overfished species prohibitively expensive and could constrain a significant portion of the fleet. It may also reward those who contributed most heavily to the decline of overfished stocks. The proxy species approach will help ensure that each fisherman is able to fish in a way that approximates his historical catch pattern.

A two year no fishing penalty is insufficient for uncoverable quota overages

This feature runs counter to the basic design of the program and should be rejected. One of the main goals of an IFQ program is to reintroduce individual accountability to the management system. A two year no fishing penalty for quota deficits is insufficient because it weakens the level of accountability. In addition, it is not clear whether an individual would have to try to acquire quota to cover the deficit through the market. While opposing this provision may seem draconian, it is important to note that fishermen would be eligible to participate in non-groundfish fisheries until their overage is covered.

Quota should be split at the 40.10.

For those species that are managed using coastwide OYs, we support subdividing quota geographically at the 40°10' line. In the absence of more definitive information of the range of distinct substocks, even this one split may help to prevent isolated geographical depletion due to shifting fishing patterns. We believe that a precautionary approach is advisable as it will be more difficult to subdivide quota after program implementation, especially once it has been traded.

Gear switching will foster significant environmental benefits

One of the laudable features of the proposed IFQ program is the gear switching component. It should enable fishermen to decrease bycatch by employing other legal groundfish gears that may be better at avoiding sensitive species. Bottom contact with trawl gear would also be reduced and fishermen may be able to increase revenue. While large boats may be unlikely to take advantage of this provision, skippers of smaller boats with lower overhead and smaller average landings have indicated enthusiasm for gear switching. We ask that the Council conduct analysis of the possible economic and ecological impacts if fishermen were offered a window period to try other gears, after which they would be required to choose a gear type.

Conclusion

EDF wishes to reiterate our support for the Council's work on developing an IFQ program for the groundfish trawl fishery. We fully believe that this transformation will result in a healthier and more profitable fishery benefitting fishermen, processors, communities and the resource. We ask the Council to take the same thoughtful approach on selecting a preferred alternative as it has taken throughout this process, and to continue to build a strong record based on sound analysis to support that decision.

We look forward to continuing to work with stakeholders and the Council on this historic program. If you have any questions about these comments, please do not hesitate to contact me.

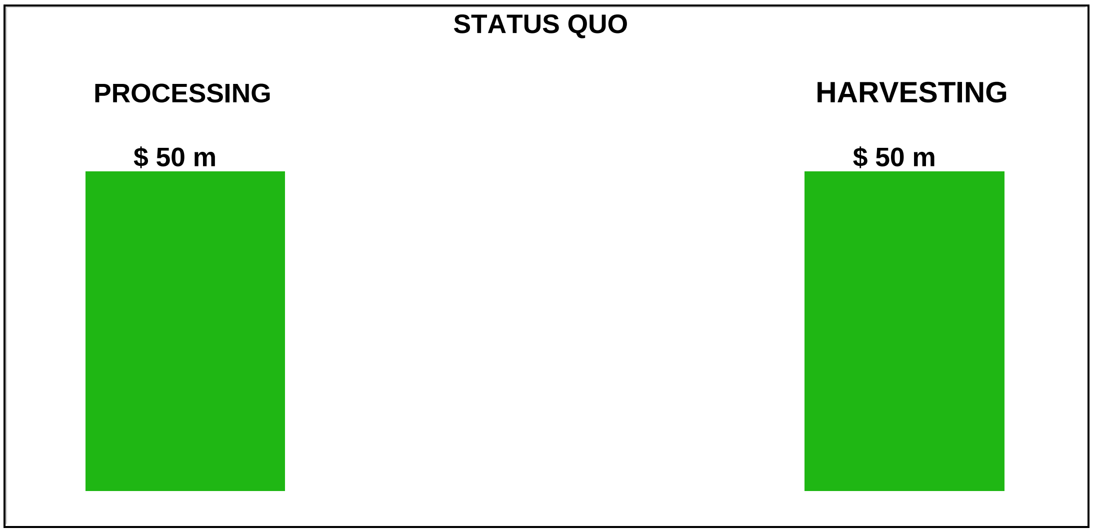
Sincerely,

Johanna Thomas
Oceans Program Policy Director, Pacific Coast
123 Mission Street, 28th Floor
San Francisco, CA 94105
(415) 293-6050

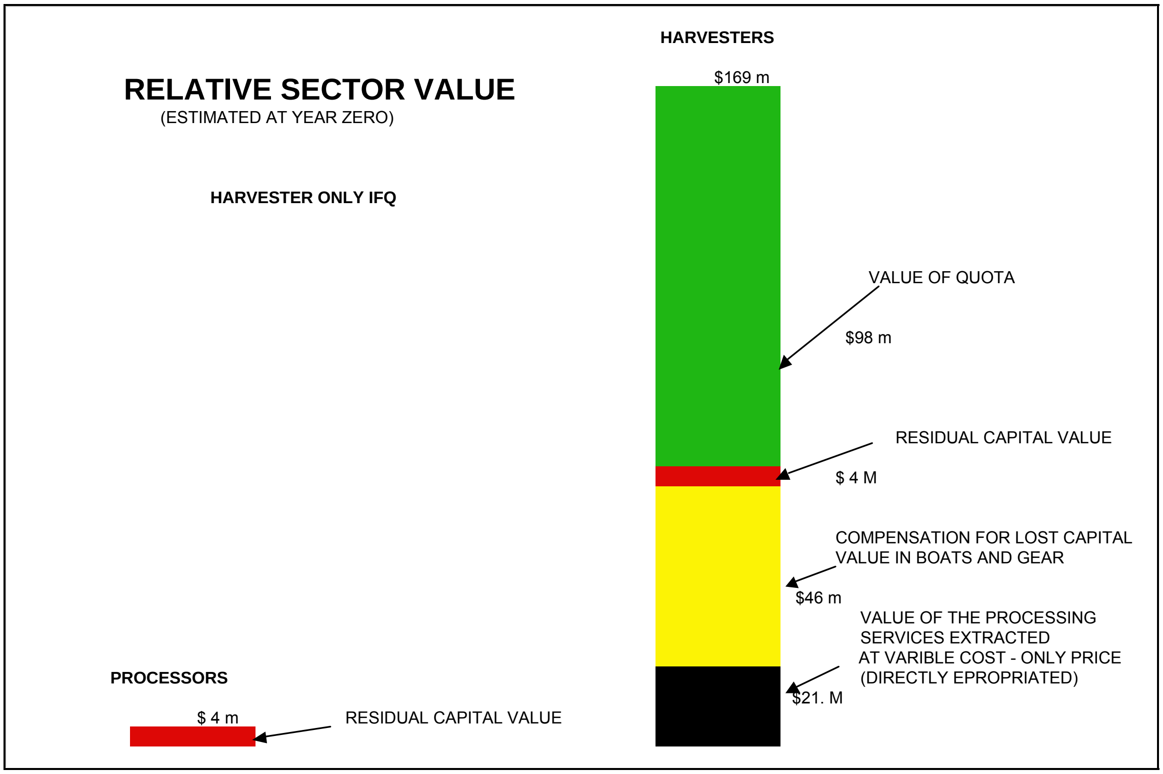
Agenda Item F.6.d
Supplemental Public Comment 9
June 2008

PowerPoint Slides from Mr. Joe Plesha, Trident Seafoods, Newport, OR
June 11, 2008; 5:30 pm

Relative Sector Value of Inshore Whiting Industry



Open Access



IFQ Allocated Only to Vessel Owners

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW) PROPOSAL
FOR GROUNDFISH ALLOCATION COMMITTEE CONSIDERATION

Regional Landing Zones—Promoting Sustained Participation and Stability of Groundfish-Dependent Fishing Communities

Proposal: Add a landing requirement alternative to A-1.2 "IFQ Management Units" that would tie a set percentage of QS to regional zones.

Purpose: To provide stability to coastal communities and prevent excessive geographic consolidation of the fleet while allowing for a reasonable level of consolidation and improved harvesting cost efficiency in the fleet.

Description of the Proposal

- Two basic types of QS would be issued for target species: zone-specific QS and freely transferable QS. QP from zone-specific QS could only be landed in the zone for which the QS was issued. Zone-specific QS would be transferable but the QP associated with that QS would always have to be landed within the specified zone.

- Zones would be limited in number (i.e., 2-6 per state with a coastwide maximum of 10), designed and nominated by the states, and approved by the Council. The states could design individual zones to encompass a single port or group of ports. WDFW would likely nominate 2 zones: Bellingham-North Coast and South Coast-Columbia River.

- The Council would decide the overall split between zone-specific and freely transferable QS (e.g., 80% zone-specific, 20% fully transferable). Each permit owner or processor would be allocated the same split of zone-specific and freely transferable QS. The analysis should consider a reasonable range of zone-specific/freely transferable splits (e.g., 80/20, 75/25, 50/50).

- Zone-specific QS would be issued to permit owners based on the permit's landings history over a time period chosen to reflect recent conditions (e.g., 2005-2007). For each target species, permit owners would receive zone-specific QS based on the proportion of landings history in each zone.

- The Council could maintain some degree of control over the IFQ system and adaptively manage the system by varying the split of zone-specific to freely transferable QS, redistributing QS among zones, permitting limited transfers between zones, adding or subtracting zones, etc.

Rationale

The EIS predicts that the non-whiting trawl fleet is expected to consolidate 50-66 percent under an IFQ system down to 40-60 vessels (section 4.17.2.1; p. 300). The consolidation, driven primarily by harvesting cost efficiency, is also expected to shift the geographic distribution of fishing effort and landings. While increased efficiency should translate into increased profits for quota holders remaining in the fishery, there is no guarantee that the benefits would be distributed evenly among the states or achieved without substantial disruption to local economies. Like with the LE trawl buyback program where some ports lost all of their vessels, some communities could be disproportionately harmed by consolidation of the fleet.

The regional landings requirement envisioned by this proposal would be intended to mitigate against such disproportionate harm by ensuring that groundfish dependent communities continued to receive a percentage of their recent landings. Consolidation could occur rapidly under an IFQ system (section 4.17.2.1; p. 301). The Adaptive Management option (A-3) under consideration would give the Council means to address unforeseen consequences after this consolidation has occurred. In contrast, a regional landings requirement would be an additional or alternative tool intended to give the Council more direct and proactive control over the geography of the fishery.

Section 303A of the MSA (16 U.S.C. 1853a)

> *(5) ALLOCATION.—In developing a limited access privilege program to harvest fish a Council or the Secretary shall—*
>
> . . .
>
> *(B) consider the basic cultural and social framework of the fishery, especially through—*
>
> > *(i) the development of policies to promote the sustained participation of small owner-operated fishing vessels and fishing communities that depend on the fisheries, including* ***regional or port-specific landing or delivery requirements****; and*
> >
> > *(ii) procedures to address concerns over excessive geographic or other consolidation in the harvesting or processing sectors of the fishery;*

(Refer to Table 2-3, p. 45. Only elements with options are addressed; otherwise, the element will be implemented as specified.)

(Note: Underlined indicates option selected is different than GAC recommendation; **BOLD and underlined and shaded** is new option)

Motion # 1: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

1. The Catcher-Processor sector would be managed under co-ops

2. The mothership sector would be managed under co-ops

3. The shoreside whiting sector would be managed under an individual fishing quota (IFQ) system or, pending approval of legislation, under co-ops

4. The shoreside non-whiting sector would be managed under an IFQ system

Motion # 2: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A. Trawl Sector Management

A.1.1 Scope for IFQ Management, Including Gear Switching

A.1.2 IFQ Management Units

Species Option: QS/QP will be for the species and species groups specified in the ABC/OY table produced as part of the biennial harvest specifications, with the exception of certain species rarely taken in the groundfish trawl fishery (TIQC recommendation) and spiny dogfish (consistent with GAC recommendation for Intersector Allocation), which is primarily a non-target species. The catches of these species would be accounted for and tracked against the overall OY. If a trawl allocation for any of these species is adopted in the future, then QS/QP for those species could be added at that time.

Option: Geographic Zones (see Supplemental WDFW Attachment 1) or split at 40 deg, 10 min

A.1.3 Trawl Sectors – Option 1: 3 trawl sectors

A.1.6 Groundfish Permit Length Endorsements – Remove length endorsement

Motion # 3: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A.2.1 Initial Allocation

Shoreside Whiting: 20% Processors; 80% Harvesters (absent a co-op system)

Definition of Processor: Option 1: attribute history to the receiver reported on the fish ticket

Shoreside Non-whiting: 20% Processors; 80% Harvesters

Definition of Processor: Option 1: attribute history to the receiver reported on the fish ticket

Motion # 4: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A.2.1.2 Recent Participation

Permits – Recent participation not required

Processors – Motherships: 1000 mt or more of groundfish in any two years 1997-03

Processors – Shoreside:

Non-Whiting: Option 2 – 6 mt or more of deliveries from non-whiting groundfish in each of any three years from 1998-2003

Whiting: Option 2 – 1 mt or more of deliveries from whiting trips in each of any two years from 1998-2006

Motion # 5: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A.2.1.3 Allocation Formula

Permits: Option 2 – an equal division of the buyback permits' pool of QS among all qualifying permits plus allocation of the remaining QS based on each permit's history

Non-whiting Overfished Species: Option 2 – use bycatch rates

Whiting Bycatch Species: Option 2 – pro-rata based on whiting allocation

Catcher-Processors: Option 2 – pro-rata based on whiting allocation

Motherships: Option 2 – pro-rata based on whiting allocation

Shoreside Processors - Whiting: No bycatch allocation; whiting allocation only

Shoreside Processors – Non-whiting; For all species other than incidental species allocate QS based on entity's history for the allocation period of 1994-2003 (drop two worst years) and use relative history. For incidental species use same allocation options identified for permits.

Motion #6: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A.2.2.1 Permit/IFQ Holding Requirement

If a vessel has an overage:

Sub-element 4: Allow exceptions for vessel to participate in the following non-groundfish fisheries: salmon troll; HMS troll/surface hook-and-line; Dungeness crab; all other HMS gears, except small mesh gillnet; and CPS purse seine. **Specify that vessels are prohibited from participating in state trawl fisheries, such as pink shrimp, California halibut, ridgeback prawn, and sea cucumber, and small mesh gillnet.**

Sub-element 6: Allow vessel to resume fishing after designated period of time depending on degree of violation (i.e., sliding scale based on amount of overage); e.g., minimum of 4 months (120 days) for 100 lbs plus an additional month for every additional 50 pounds of overage (1 mt overage = 44 months)

A.2.2.2 IFQ Annual Issuance

Carryover Allowance: Will not apply to QP that are not transferred to a vessel's account

A.2.2.3 IFQ Transfer Rules

Temporary Transfer Provision: QS will not be transferred in the first year of the program (QP will be transferable)

Accumulation Limits: GAC recommendation as modified by TIQC

Grandfather Clause: Option 3 – None

Motion # 7: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A.2.3.1 Tracking, Monitoring and Enforcement

<u>T & M Program Alt 1: discards allowed; discards of IBQ required</u>

At-Sea Catch Monitoring

<u>Non-whiting: T & M Program Alt 2: At-sea observers required</u>

<u>Shoreside whiting: Observers would be required in addition to or as a replacement for video monitoring</u>

<u>At-sea whiting: Observers would be required in addition to or as a replacement for video monitoring</u>

<u>At-sea whiting motherships and catcher/processors: Remove reference to "Supplemental video monitoring on processors may also be used."</u>

Shoreside Catch Monitoring – Included as specified

Catch Tracking Mechanisms – Included as specified

Cost Control Mechanisms

<u>Landing hour restrictions: T & M Program Alt 2: Landing hours limited</u>

Vessel Certification – Included as specified

Program Performance Measures – Included as specified

A.2.3.3 Program Costs

<u>Cost Recovery: Option 1 – Fees up to 3%</u>

A.2.3.4 Program Duration and Modification – Included as specified

Motion # 8: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A.3 Adaptive Management

Include as specified up to 10%, except would be sector-specific (consistent with GAC recommendation). The Council would specify through the biennial specifications process whether to set aside a portion for adaptive management for each sector, and the amount to be set aside (if any).

Motion # 9: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

A.2.4 Additional Measures for Processors

Option 2 – The accumulation limit grandfather clause will not apply for processing history

A.4 Pacific Halibut IBQ

Option: IBQ for Pacific halibut bycatch in the trawl fishery will be established

A.5 Alternative Scope for IFQ Management

Option: IFQ will be required to cover all groundfish catch except for bycatch species taken on whiting sector trips

Bycatch Management: Option 4 – Separate bycatch caps by whiting sector with a roll-over provision

A.6 Duration: Fixed Term (and Auctions)

Option: None

Motion # 10: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

B.1 Whiting Sector Management Under Co-ops

B.1.2 Annual Whiting Rollovers

Option 1 – there will not be a rollover of unused whiting from one sector to another

B.1.3 Bycatch Species Management

Subdivision Option D – subdivide among whiting sectors and within sectors, subdivide between co-op and non-co-op fishery and among co-ops within sectors

B.1.3.2 Bycatch Management

Strike seasonal allocation alternatives

Rollover: Option 1 – unused bycatch may be rolled over from sector to another if the sector's full allocation of whiting has been harvested or participants do not intend to harvest the remaining sector allocation

Bycatch Buffer: Option 2 – for the non-co-op fishery, there will not be a buffer; the fishery will close based on **projected** attainment of its allocation

B.1.4 At-sea Observers/Monitoring – As specified

B.1.5 Mandatory Data Collection – As specified

Annual co-op reports required to Council

B.1.6 Adaptive Management

Option: Sector-specific consistent with Motion # 8

Motion # 11: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

B.2 Whiting Mothership Sector Co-op Program

B.2.1 Participation in the Mothership Sector – As specified for catcher vessels and processors

Vessels Excluded: Option 1 – Motherships operating as a C/P may not operate as a mothership during a year in which it also participates as a C/P

B.2.2 Permits/Endorsement Qualification and Characteristics

B.2.2.1 Qualifying for a CV (MS) Whiting Endorsement: Option 2 – 1997 through 2003

Catch History Assignment: Best 6 out of 7 years from 1997 through 2003

Whiting Endorsement Transferability and Endorsement Severability: Transfer Option 2 – the CV whiting endorsement may be severed from the permit. **CV permit may not be transferred to a vessel engaged in the processing of whiting in the year of the transfer.**

Accumulation Limit – Equal to amount of largest current owner; no grandfather clause

Motion # 12: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

B.2.2.2 Mothership Processor Permit

<u>Qualifying Entities: Option 2 – the owners of qualifying motherships will be issued MS permits</u>

Qualification Requirements: Minimum requirement of 1000 mt of whiting in any two years 1997-03

Transferability: MS permits will be transferable and MS permits may be transferred to a vessel of any size; and

3) Option 1 – MS permits may not be transferred to a vessel engaged in the harvest of whiting in the year of the transfer; and

<u>4) Option 3 – MS permits may be transferred two times during the fishing year</u>

<u>Usage Limit: Option 4 – No individual or entity owning a MS permit may process more than 40% of the total mothership sector whiting allocation</u>

B.2.3 Co-op Formation and Operation Rules

Co-op Formation: Option 2 – Multiple co-ops are not required, but may be voluntarily formed

B.2.3.3 Co-op Agreement Standards – As presented, modified based on guidance from November 2007

Motion # 13: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

B.2.4 Processor Ties

Option 4 – Permits will be obligated to deliver 90% of their catch (the permits' "obligated deliveries") to certain motherships, as specified below

B.2.4.1 Formation and Modification of Processor Tie Obligations

Option 4 – If the permit chooses to participate in a co-op its obligated deliveries must go to the licensed mothership to which the permit made a majority of its whiting deliveries in 2009

B.2.4.2 Flexibility in Meeting Processor Tie Obligations – As specified

B.2.4.3 Mothership Processor Withdrawal – Mutual agreement required; neither option applies

Motion # 14: Move to adopt as the Council's Preliminary Preferred Alternative, the following:

B.4 Co-ops for Catcher-Processors – As specified; include the following:

Issue Permits to Co-Op

Specify harvest amounts in regulation for co-op members

Require unanimous consent for a member to leave the co-op

Mandatory Data Collection

Annual co-op report requirement

Bycatch: The fishery will close based on projected attainment of its allocation

Motion # 15: Move to adopt the Trawl Rationalization package (Amendment 20) for public review with the Council's Preliminary Preferred Alternatives as specified in the previous actions.

COUNCIL CLARIFICATION OF TENTATIVELY ADOPTED 2009-2010 GROUNDFISH HARVEST SPECIFICATIONS, MANAGEMENT MEASURES, AND REBUILDING PLAN REVISIONS (IF NEEDED)

This agenda item provides the chance for the Groundfish Advisory Subpanel (GAP) and the Groundfish Management Team (GMT) to present initial analysis of the 2009 and 2010 management measures tentatively adopted under Agenda Item F.4 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 2009 and 2010 management measures under Agenda Item F.9.

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. Agency and Tribal Comments
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. Council Discussion and Guidance

PFMC
05/22/08

Agenda Item F.8
Situation Summary
June 2008

FINAL CONSIDERATION OF INSEASON ADJUSTMENTS

Consideration of inseason adjustments to 2008 groundfish fisheries may be a two-step process at this meeting. The Council will meet on Wednesday, June 11, 2008 and consider advisory body advice and public comment on inseason adjustments under Agenda Item F.5. If the Council elects to make final inseason adjustments under Agenda Item F.5, then this agenda item may be cancelled, or the Council may wish to clarify and/or confirm these decisions. If the Council tasks advisory bodies with further analysis under Agenda Item F.5, then the Council task under this agenda item is to consider advisory body advice and public comment on the status of 2008 groundfish fisheries and adopt final inseason adjustments as necessary.

Council Action:

1. **Consider information on the status of ongoing 2008 fisheries and adopt inseason adjustments as necessary.**

Reference Materials:

None.

Agenda Order:

a. Agenda Item Overview — Merrick Burden
b. Report of the Groundfish Management Team — Robert Jones
c. Agency and Tribal Comments
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action:** Adopt or Confirm Final Adjustments to 2008 Groundfish Fisheries

PFMC
05/23/08

Agenda Item F.9
Situation Summary
June 2008

FINAL ADOPTION OF 2009-2010 GROUNDFISH HARVEST SPECIFICATIONS, MANAGEMENT MEASURES, AND REBUILDING PLAN REVISIONS

This is the final step of three at this meeting (Agenda Items F.4 and F.7 being the other two) in the process to adopt final 2009-2010 groundfish fishery management measures that will be recommended to the U.S. Secretary of Commerce. The final motions should be available in writing prior to the Council's vote.

Council Action:

1. **Adopt Final Groundfish Harvest Specifications for 2009-2010 Fisheries.**
2. **Adopt Final 2009-2010 Groundfish Fishery Management Measures.**
3. **Adopt Final Rebuilding Plan Revisions for Depleted Groundfish Species.**

Reference Materials:

None.

Agenda Order:

a. Agenda Item Overview — John DeVore
b. Agency and Tribal Comments
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Adopt Final 2009-2010 ABC, OY, Management Measures, and Revised Rebuilding Plans for Overfished Species

PFMC
05/21/08

Preliminary Economic Analysis of the 2009-10 Groundfish Spex Management Alternatives

This packet contains tables and graphs illustrating economic impacts of the management alternatives for commercial fisheries and recreational fisheries on coastal communities.

Commercial Fisheries Impacts:

Alternatives illustrated in Tables Com 1 and Com 2 and Figures Com 1, Com 2 and Com 3 show income impacts attributed to the following elements:

2007: Landings and deliveries recorded in 2007.

No Action: Projected landings and deliveries by commercial fisheries sectors in 2008.

Op1_09aCP: Estimated LE Trawl 2009 council preliminary preferred option + any LE fixed gear alternative (excluding nearshore OA) + 298,000 mt whiting catch.

Op1_09b: LE Trawl 2009 option 1 + any LE fixed gear alternative (excluding nearshore OA) + 280,000 mt whiting catch.

Op1_10CP: LE Trawl 2010 option 1 + any LE fixed gear alternative (excluding nearshore OA) + 298,000 mt whiting catch.

Op2: LE Trawl 2009 option 2 + any LE fixed gear alternative (excluding nearshore OA) + 228,000 mt whiting catch.

Op3: LE Trawl 2009 option 3 + any LE fixed gear alternative (excluding nearshore OA) + 190,000 mt whiting catch.

Op4: LE Trawl 2009 option 4 + any LE fixed gear alternative (excluding nearshore OA) + 329,000 mt whiting catch.

Op5a: LE Trawl 2009 option 5a + any LE fixed gear alternative (excluding nearshore OA) + 228,000 mt whiting catch.

Op5b: LE Trawl 2009 option 5b + any LE fixed gear alternative (excluding nearshore OA) + 329,000 mt whiting catch.

Table Com 1: Estimated income impacts ($ million) associated with commercial fishing activities in port areas under the management alternatives. Totals include contributions from the following sectors: at sea whiting CPs, at sea whiting motherships, shoreside whiting trawl, shoreside nonwhiting trawl, LE fixed gear, OA fixed gear (except nearshore fisheries), and treaty groundfish sectors.

Table Com 2: Change in commercial fishing income impacts ($ million) under the management alternatives compared with No Action. Totals include contributions from at sea whiting CPs, at sea whiting motherships, shoreside whiting trawl, shoreside nonwhiting trawl, LE fixed gear, OA fixed gear (except nearshore fisheries), and treaty groundfish sectors.

Figure Com 1: Estimated income impacts ($ million) associated with commercial fishing activities under the management alternatives by sector [treaty groundfish fisheries, at sea whiting motherships, at sea whiting CPs, OA fixed gear (except nearshore fisheries), LE fixed gear, shoreside nonwhiting trawl, and shoreside whiting trawl].

Figure Com 2: Estimated income impacts ($ million) associated with the nearshore OA commercial fishery alternatives (see p. 152 in F.4.a Supplemental Attachment 2, June 2008 for a list of these alternatives).

Figure Com 3: Estimated income impacts ($ million) associated with commercial fishing activities under the management alternatives arrayed by port area. Sectors include treaty groundfish, at sea whiting motherships, at sea whiting CPs, OA fixed gear (except nearshore fisheries), LE fixed gear, shoreside nonwhiting trawl, and shoreside whiting trawl.

Recreatonal Fisheries Impacts:

The following tables illustrate recreational fisheries impacts under each state's of management options. Note: "WA OP 0", "OR OP 1" and "CA OP 0" depict estimated impacts under zero mortality scenarios for yelloweye rockfish.

Table Rec 1 (four pages): Estimated number of boat-based, marine **angler trips** by boat category, trip target, and region under the each state's management options and in 2005-2007. Page one shows results for Washington, page two for Oregon, and pages three and four show California.

Table Rec 2 (four pages): Estimated **income impacts** (million $) resulting from expenditures made for boat-based, marine angler trips by boat category, trip target, and region under each state's management options and in 2005-2007. Page one shows results for Washington, page two for Oregon, and pages three and four depict California.

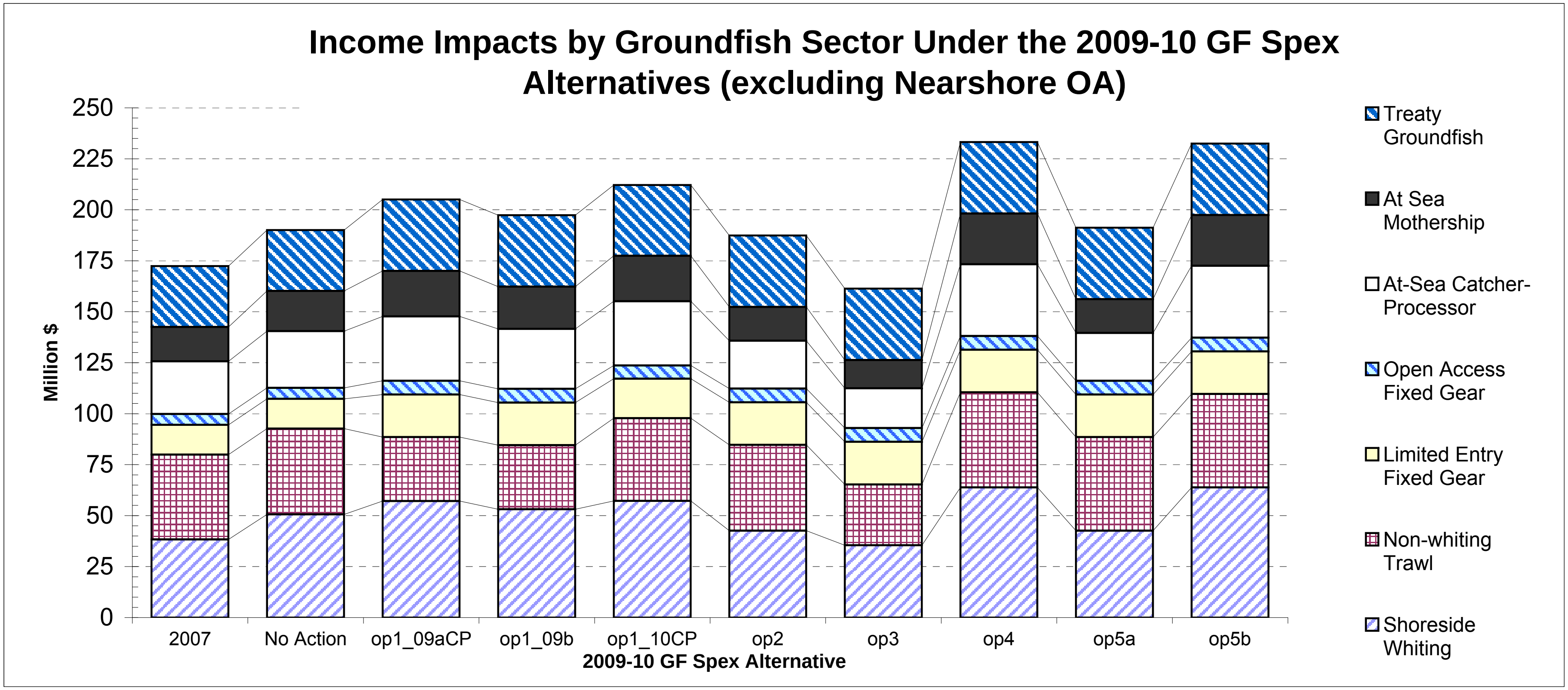
Table Rec 3 (four pages): Estimated change in **income impacts** with respect to No Action / Status Quo (SQ) (million $) resulting from expenditures made for boat-based, marine angler trips by boat category, trip target, and region under each state's management options. Page one shows results for Washington, page two for Oregon, and pages three and four depict California.

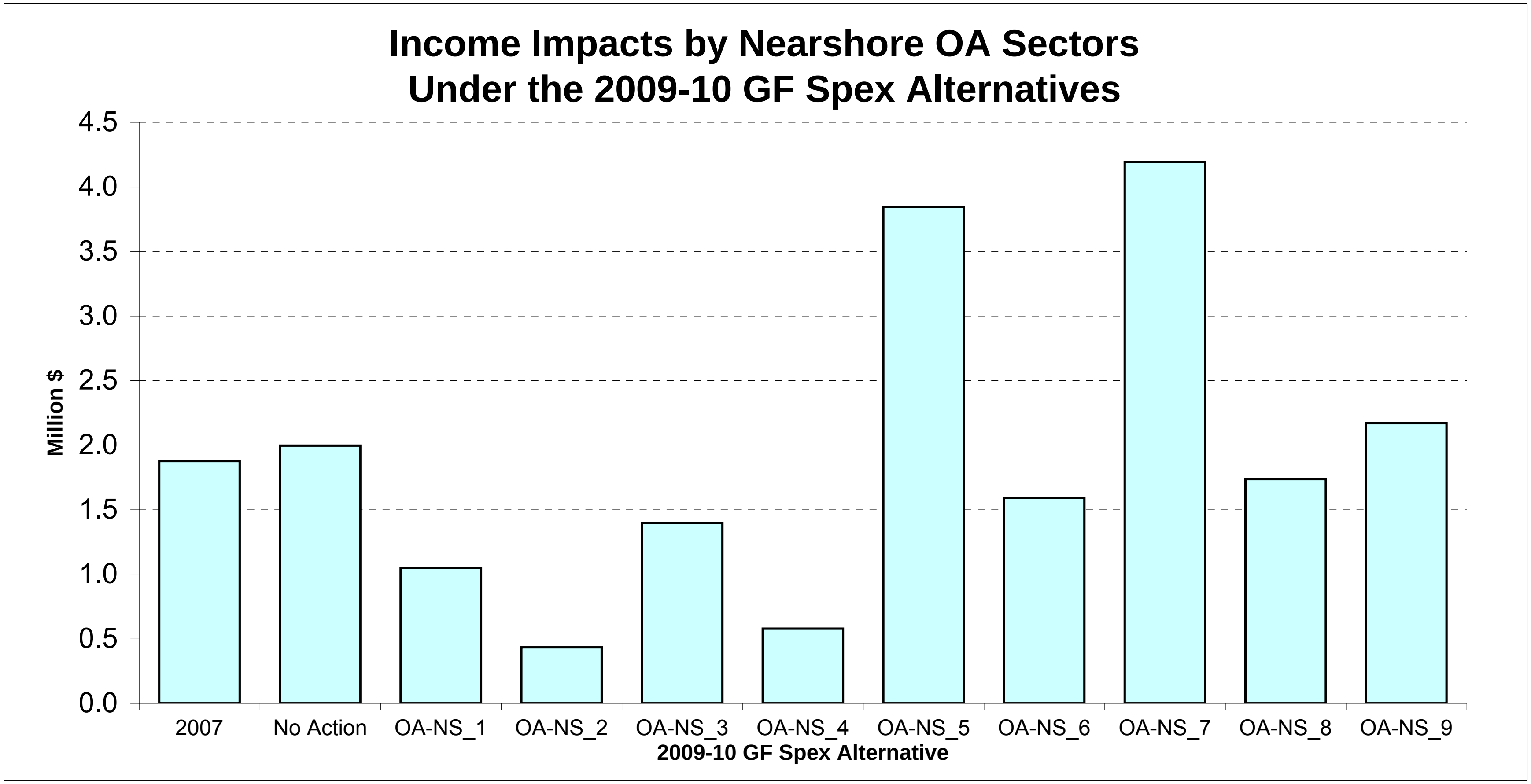
Estimated Income Impacts for Groundfish Sectors from all Groundfish Species by Port Area Under the 2009-10 GF Spex Alternatives (Million $)

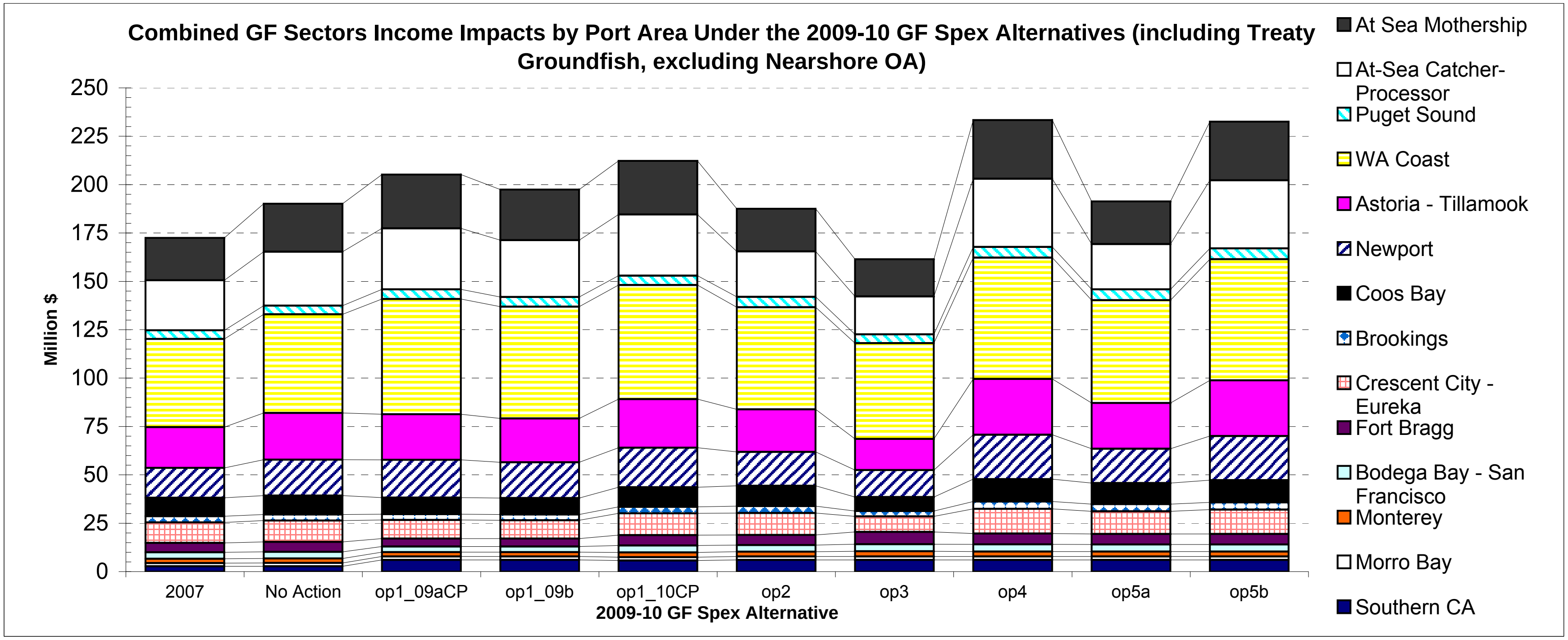
Groundfish Sector	Port Area	2007	No Action	op1_09aCP	op1_09b	op1_10CP	op2	op3	op4	op5a	op5b
		LE Trawl non-whiting, LE Trawl whiting, LE Fixed Gear, Open Access (except nearshore) and Treaty Sectors Alternatives									
Whiting C-P		25.83	27.87	31.56	29.35	31.56	23.45	19.54	35.22	23.45	35.22
CV-Mothership		16.87	19.69	22.29	20.73	22.29	16.57	13.81	24.88	16.57	24.88
Shoreside Whiting	South and Central Washington Coast	17.15	22.67	25.61	23.83	25.62	19.07	15.90	28.59	19.09	28.59
	Astoria	9.24	12.19	13.75	12.80	13.77	10.27	8.55	15.36	10.28	15.36
	Newport	9.26	12.23	13.79	12.83	13.83	10.31	8.55	15.44	10.32	15.43
	Coos Bay	1.10	1.46	1.65	1.53	1.65	1.23	1.02	1.84	1.23	1.84
	Crescent City	0.43	0.57	0.65	0.60	0.65	0.48	0.40	0.72	0.48	0.72
	Eureka	1.13	1.49	1.68	1.56	1.68	1.26	1.04	1.88	1.26	1.88
	Morro Bay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-whiting Trawl	Northern Puget Sound	1.67	1.62	1.39	1.39	1.53	1.79	0.99	1.93	1.93	1.93
	North Washington Coast	0.20	0.20	0.19	0.19	0.20	0.04	0.03	0.20	0.20	0.20
	South and Central Washington Coast	0.90	0.90	0.81	0.82	0.82	0.72	0.57	0.95	0.94	0.94
	Astoria	11.02	11.13	8.75	8.76	10.34	10.66	6.51	12.42	12.28	12.28
	Tillamook	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02
	Newport	4.06	4.20	2.86	2.87	4.00	4.37	2.56	4.66	4.58	4.58
	Coos Bay	6.90	6.76	4.99	4.99	6.65	7.31	4.22	7.76	7.68	7.68
	Brookings	1.82	1.76	1.22	1.22	1.72	1.84	1.04	2.06	1.99	1.99
	Crescent City	1.43	1.41	1.05	1.05	1.36	1.38	0.88	1.61	1.55	1.55
	Eureka	6.28	6.19	4.60	4.60	6.04	6.52	4.08	6.92	6.78	6.78
	Fort Bragg	3.58	3.93	2.51	2.51	3.95	3.68	4.79	4.02	3.90	3.90
	Bodega Bay	0.08	0.08	0.07	0.07	0.08	0.07	0.07	0.09	0.09	0.09
	San Francisco	2.63	2.75	2.11	2.11	2.76	2.65	2.84	2.83	2.78	2.78
	Monterey	0.98	1.06	0.77	0.77	1.05	0.95	1.15	1.07	1.06	1.06
	Morro Bay	0.07	0.09	0.05	0.05	0.07	0.06	0.10	0.07	0.07	0.07
Limited Entry Fixed Gear	Northern Puget Sound	2.66	2.66	3.40	3.40	3.15	3.40	3.40	3.40	3.40	3.40
	Southern Puget Sound	0.08	0.08	0.11	0.11	0.10	0.11	0.11	0.11	0.11	0.11
	North Washington Coast	1.07	1.07	1.40	1.40	1.29	1.40	1.40	1.40	1.40	1.40
	South and Central Washington Coast	1.09	1.09	1.43	1.43	1.31	1.43	1.43	1.43	1.43	1.43
	Astoria	0.70	0.70	0.92	0.92	0.84	0.92	0.92	0.92	0.92	0.92
	Tillamook	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Newport	2.07	2.07	2.74	2.74	2.51	2.74	2.74	2.74	2.74	2.74
	Coos Bay	1.29	1.29	1.70	1.70	1.56	1.70	1.70	1.70	1.70	1.70
	Brookings	0.83	0.83	1.06	1.06	0.98	1.06	1.06	1.06	1.06	1.06
	Crescent City	0.32	0.32	0.40	0.40	0.37	0.40	0.40	0.40	0.40	0.40
	Eureka	0.57	0.57	0.76	0.76	0.69	0.76	0.76	0.76	0.76	0.76
	Fort Bragg	0.60	0.60	0.79	0.79	0.72	0.79	0.79	0.79	0.79	0.79
	Bodega Bay	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	San Francisco	0.24	0.24	0.31	0.31	0.28	0.31	0.31	0.31	0.31	0.31
	Monterey	0.79	0.79	0.96	0.96	0.90	0.96	0.96	0.96	0.96	0.96
	Morro Bay	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	Santa Barbara	0.40	0.40	0.63	0.63	0.60	0.63	0.63	0.63	0.63	0.63
	Los Angeles	1.24	1.24	2.87	2.87	2.72	2.87	2.87	2.87	2.87	2.87
	San Diego	0.51	0.51	1.31	1.31	1.23	1.31	1.31	1.31	1.31	1.31
Open Access Fixed Gear	Northern Puget Sound	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	Southern Puget Sound	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	North Washington Coast	0.18	0.18	0.23	0.23	0.22	0.23	0.23	0.23	0.23	0.23
	South and Central Washington Coast	0.22	0.22	0.28	0.28	0.26	0.28	0.28	0.28	0.28	0.28
	Astoria	0.10	0.10	0.13	0.13	0.12	0.13	0.13	0.13	0.13	0.13
	Tillamook	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	Newport	0.06	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	Coos Bay	0.21	0.21	0.28	0.28	0.25	0.28	0.28	0.28	0.28	0.28
	Brookings	0.58	0.58	0.68	0.68	0.64	0.68	0.68	0.68	0.68	0.68
	Crescent City	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Eureka	0.19	0.19	0.25	0.25	0.23	0.25	0.25	0.25	0.25	0.25
	Fort Bragg	0.62	0.62	0.77	0.77	0.71	0.77	0.77	0.77	0.77	0.77
	Bodega Bay	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
	San Francisco	0.34	0.34	0.37	0.37	0.36	0.37	0.37	0.37	0.37	0.37
	Monterey	0.45	0.45	0.53	0.53	0.50	0.53	0.53	0.53	0.53	0.53
	Morro Bay	1.50	1.50	1.63	1.63	1.59	1.63	1.63	1.63	1.63	1.63
	Santa Barbara	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	Los Angeles	0.16	0.16	0.51	0.51	0.48	0.51	0.51	0.51	0.51	0.51
	San Diego	0.10	0.10	0.33	0.33	0.31	0.33	0.33	0.33	0.33	0.33
Shoreside Treaty Groundfis	Northern Puget Sound	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	North Washington Coast	3.80	3.80	6.39	6.39	6.12	6.39	6.39	6.39	6.39	6.39
	South and Central Washington Coast	20.21	20.21	22.24	22.24	22.24	22.24	22.24	22.24	22.24	22.24
	Unidentified Washington	0.71	0.71	0.95	0.95	0.87	0.95	0.95	0.95	0.95	0.95
At=sea Treaty whiting		5.10	5.10	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46
	TOTAL	**172.40**	**190.03**	**205.08**	**197.37**	**212.18**	**187.41**	**161.36**	**233.26**	**191.23**	**232.48**

Estimated Income Impacts for Groundfish Sectors from all Groundfish Species by Port Area Under the 2009-10 GF Spex Alternatives: change from No Action (Million $)

		LE Trawl non-whiting, LE Trawl whiting, LE Fixed Gear, Open Access (except nearshore) and Treaty Sectors Alternatives									
Groundfish Sector	**Port Area**	**2007**	**No Action**	**op1_09aCP**	**op1_09b**	**op1_10CP**	**op2**	**op3**	**op4**	**op5a**	**op5b**
Whiting C-P			*27.87*	+3.68	+1.48	+3.68	-4.42	-8.33	+7.34	-4.42	+7.34
CV-Mothership			*19.69*	+2.60	+1.04	+2.60	-3.12	-5.88	+5.19	-3.12	+5.19
Shoreside Whiting	South and Central Washington Coast		*22.67*	+2.95	+1.16	+2.95	-3.60	-6.77	+5.93	-3.58	+5.93
	Astoria		*12.19*	+1.56	+0.60	+1.58	-1.92	-3.64	+3.17	-1.91	+3.17
	Newport		*12.23*	+1.56	+0.60	+1.59	-1.92	-3.68	+3.20	-1.92	+3.20
	Coos Bay		*1.46*	+0.19	+0.08	+0.19	-0.23	-0.44	+0.38	-0.23	+0.38
	Crescent City		*0.57*	+0.07	+0.03	+0.07	-0.09	-0.17	+0.15	-0.09	+0.15
	Eureka		*1.49*	+0.19	+0.07	+0.19	-0.23	-0.45	+0.39	-0.23	+0.39
	Morro Bay		*0.00*	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Non-whiting Trawl	Northern Puget Sound		*1.62*	-0.23	-0.23	-0.09	+0.17	-0.64	+0.31	+0.31	+0.31
	North Washington Coast		*0.20*	-0.01	-0.01	-0.00	-0.16	-0.17	+0.00	+0.00	+0.00
	South and Central Washington Coast		*0.90*	-0.09	-0.09	-0.08	-0.18	-0.33	+0.05	+0.04	+0.04
	Astoria		*11.13*	-2.38	-2.37	-0.79	-0.48	-4.62	+1.29	+1.15	+1.15
	Tillamook		*0.02*	-0.00	-0.00	-0.00	-0.01	-0.01	+0.00	+0.00	+0.00
	Newport		*4.20*	-1.33	-1.33	-0.19	+0.18	-1.64	+0.46	+0.39	+0.39
	Coos Bay		*6.76*	-1.77	-1.77	-0.11	+0.55	-2.54	+1.00	+0.92	+0.92
	Brookings		*1.76*	-0.54	-0.54	-0.04	+0.08	-0.72	+0.29	+0.23	+0.23
	Crescent City		*1.41*	-0.35	-0.35	-0.04	-0.02	-0.53	+0.20	+0.14	+0.14
	Eureka		*6.19*	-1.59	-1.59	-0.16	+0.33	-2.11	+0.73	+0.59	+0.59
	Fort Bragg		*3.93*	-1.42	-1.42	+0.02	-0.25	+0.87	+0.10	-0.03	-0.03
	Bodega Bay		*0.08*	-0.01	-0.01	+0.00	-0.01	-0.01	+0.00	+0.00	+0.00
	San Francisco		*2.75*	-0.64	-0.64	+0.01	-0.10	+0.10	+0.09	+0.03	+0.03
	Monterey		*1.06*	-0.30	-0.30	-0.01	-0.11	+0.09	+0.01	-0.01	-0.01
	Morro Bay		*0.09*	-0.04	-0.04	-0.02	-0.03	+0.01	-0.02	-0.02	-0.02
Limited Entry Fixed Gear	Northern Puget Sound		*2.66*	+0.75	+0.75	+0.49	+0.75	+0.75	+0.75	+0.75	+0.75
	Southern Puget Sound		*0.08*	+0.03	+0.03	+0.02	+0.03	+0.03	+0.03	+0.03	+0.03
	North Washington Coast		*1.07*	+0.33	+0.33	+0.22	+0.33	+0.33	+0.33	+0.33	+0.33
	South and Central Washington Coast		*1.09*	+0.34	+0.34	+0.23	+0.34	+0.34	+0.34	+0.34	+0.34
	Astoria		*0.70*	+0.22	+0.22	+0.15	+0.22	+0.22	+0.22	+0.22	+0.22
	Tillamook		*0.00*	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	Newport		*2.07*	+0.67	+0.67	+0.44	+0.67	+0.67	+0.67	+0.67	+0.67
	Coos Bay		*1.29*	+0.41	+0.41	+0.27	+0.41	+0.41	+0.41	+0.41	+0.41
	Brookings		*0.83*	+0.23	+0.23	+0.15	+0.23	+0.23	+0.23	+0.23	+0.23
	Crescent City		*0.32*	+0.08	+0.08	+0.05	+0.08	+0.08	+0.08	+0.08	+0.08
	Eureka		*0.57*	+0.18	+0.18	+0.12	+0.18	+0.18	+0.18	+0.18	+0.18
	Fort Bragg		*0.60*	+0.18	+0.18	+0.12	+0.18	+0.18	+0.18	+0.18	+0.18
	Bodega Bay		*0.03*	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	San Francisco		*0.24*	+0.07	+0.07	+0.05	+0.07	+0.07	+0.07	+0.07	+0.07
	Monterey		*0.79*	+0.18	+0.18	+0.12	+0.18	+0.18	+0.18	+0.18	+0.18
	Morro Bay		*0.06*	+0.01	+0.01	+0.01	+0.01	+0.01	+0.01	+0.01	+0.01
	Santa Barbara		*0.40*	+0.23	+0.23	+0.21	+0.23	+0.23	+0.23	+0.23	+0.23
	Los Angeles		*1.24*	+1.64	+1.64	+1.48	+1.64	+1.64	+1.64	+1.64	+1.64
	San Diego		*0.51*	+0.80	+0.80	+0.72	+0.80	+0.80	+0.80	+0.80	+0.80
Open Access Fixed Gear	Northern Puget Sound		*0.01*	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	Southern Puget Sound		*0.01*	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	North Washington Coast		*0.18*	+0.06	+0.06	+0.04	+0.06	+0.06	+0.06	+0.06	+0.06
	South and Central Washington Coast		*0.22*	+0.07	+0.07	+0.05	+0.07	+0.07	+0.07	+0.07	+0.07
	Astoria		*0.10*	+0.03	+0.03	+0.02	+0.03	+0.03	+0.03	+0.03	+0.03
	Tillamook		*0.02*	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	Newport		*0.06*	+0.02	+0.02	+0.01	+0.02	+0.02	+0.02	+0.02	+0.02
	Coos Bay		*0.21*	+0.07	+0.07	+0.04	+0.07	+0.07	+0.07	+0.07	+0.07
	Brookings		*0.58*	+0.10	+0.10	+0.07	+0.10	+0.10	+0.10	+0.10	+0.10
	Crescent City		*0.25*	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	Eureka		*0.19*	+0.06	+0.06	+0.04	+0.06	+0.06	+0.06	+0.06	+0.06
	Fort Bragg		*0.62*	+0.15	+0.15	+0.10	+0.15	+0.15	+0.15	+0.15	+0.15
	Bodega Bay		*0.05*	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	San Francisco		*0.34*	+0.03	+0.03	+0.02	+0.03	+0.03	+0.03	+0.03	+0.03
	Monterey		*0.45*	+0.08	+0.08	+0.05	+0.08	+0.08	+0.08	+0.08	+0.08
	Morro Bay		*1.50*	+0.13	+0.13	+0.09	+0.13	+0.13	+0.13	+0.13	+0.13
	Santa Barbara		*0.35*	+0.01	+0.01	+0.01	+0.01	+0.01	+0.01	+0.01	+0.01
	Los Angeles		*0.16*	+0.35	+0.35	+0.31	+0.35	+0.35	+0.35	+0.35	+0.35
	San Diego		*0.10*	+0.23	+0.23	+0.21	+0.23	+0.23	+0.23	+0.23	+0.23
Shoreside Treaty Groundfis	Northern Puget Sound		*0.02*	+0.02	+0.02	+0.02	+0.02	+0.02	+0.02	+0.02	+0.02
	North Washington Coast		*3.80*	+2.59	+2.59	+2.32	+2.59	+2.59	+2.59	+2.59	+2.59
	South and Central Washington Coast		*20.21*	+2.02	+2.02	+2.02	+2.02	+2.02	+2.02	+2.02	+2.02
	Unidentified Washington		*0.71*	+0.24	+0.24	+0.16	+0.24	+0.24	+0.24	+0.24	+0.24
At=sea Treaty whiting			*5.10*	+0.35	+0.35	+0.35	+0.35	+0.35	+0.35	+0.35	+0.35
	TOTAL		***190.03***	**+15.05**	**+7.33**	**+22.15**	**-2.63**	**-28.68**	**+43.22**	**+1.19**	**+42.44**


Income Impacts by Groundfish Sector Under the 2009-10 GF Spex Alternatives (excluding Nearshore OA)
Million $
250
225
200
175
150
125
100
75
50
25
0
2007
No Action
op1_09aCP
op1_09b
op1_10CP
op2
op3
op4
op5a
op5b
2009-10 GF Spex Alternative
Treaty Groundfish
At Sea Mothership
At-Sea Catcher-Processor
Open Access Fixed Gear
Limited Entry Fixed Gear
Non-whiting Trawl
Shoreside Whiting


Income Impacts by Nearshore OA Sectors
Under the 2009-10 GF Spex Alternatives
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Million $
2007
No Action
OA-NS_1
OA-NS_2
OA-NS_3
OA-NS_4
OA-NS_5
OA-NS_6
OA-NS_7
OA-NS_8
OA-NS_9
2009-10 GF Spex Alternative



Combined GF Sectors Income Impacts by Port Area Under the 2009-10 GF Spex Alternatives (including Treaty Groundfish, excluding Nearshore OA)
Million $
250
225
200
175
150
125
100
75
50
25
0
2007
No Action
op1_09aCP
op1_09b
op1_10CP
op2
op3
op4
op5a
op5b
2009-10 GF Spex Alternative
At Sea Mothership
At-Sea Catcher-Processor
Puget Sound
WA Coast
Astoria - Tillamook
Newport
Coos Bay
Brookings
Crescent City - Eureka
Fort Bragg
Bodega Bay - San Francisco
Monterey
Morro Bay
Southern CA

Table Rec 1 (p. 1 of 4)

Table 7-xx. Estimated West Coast recreational ocean angler effort by state, region, boat type and species target in 2005, 2006, 2007 and projected under each state's management options (angler trips) (page 1 of 4).

State	Region	Boat Type / Trip Target	2005	2006	2007	SQ (2008)	WA OP 0	WA OP 1	WA OP 2	WA OP 3
WASHINGTON										
	North Washington Coast									
		Charter								
		Halibut	1,067	763	895	895	0	895	895	895
		Salmon	1,688	1,000	939	1,464	0	1,464	1,464	1,464
		Bottomfish	566	384	589	939	0	939	852	852
		Salm/Hlbt	2	0	21	6	0	6	6	6
		Tuna	36	44	63	40	40	40	40	40
		TOTAL	3,359	2,191	2,507	3,343	40	3,343	3,256	3,256
		Private								
		Halibut	4,156	4,379	4,200	4,200	0	4,200	4,200	4,200
		Salmon	10,821	8,616	8,636	10,420	0	10,420	10,420	10,420
		Bottomfish	4,520	3,975	4,298	4,298	0	4,298	3,583	3,583
		Salm/Hlbt	0	0	139	38	0	38	38	38
		Tuna	68	102	305	129	129	129	129	129
		TOTAL	19,565	17,072	17,578	19,084	129	19,084	18,369	18,369
	South & Central WA Coast									
		Charter								
		Halibut	3,435	2,750	2,700	2,700	0	2,700	2,700	2,700
		Salmon	29,970	23,930	26,544	28,742	0	28,742	28,742	28,742
		Bottomfish	13,114	16,231	14,448	14,448	0	14,448	14,448	14,448
		Salm/Hlbt	67	0	0	33	0	33	33	33
		Tuna	1,002	1,761	1,663	1,407	1,407	1,407	1,407	1,407
		TOTAL	47,588	44,672	45,355	47,330	1,407	47,330	47,330	47,330
		Private								
		Halibut	387	485	259	259	0	259	259	259
		Salmon	58,009	38,044	45,066	55,272	0	55,272	55,272	55,272
		Bottomfish	2,207	2,137	2,300	2,300	0	2,300	2,300	2,300
		Salm/Hlbt	4	22	58	29	0	29	29	29
		Tuna	409	739	1,561	739	739	739	739	739
		TOTAL	61,016	41,427	49,242	58,598	739	58,598	58,598	58,598
WASHINGTON TOTALS										
		Charter	50,947	46,863	47,862	50,673	1,447	50,673	50,586	50,586
		Private	80,581	68,499	66,820	77,682	867	77,682	76,967	76,967
		TOTAL	131,528	105,362	114,682	128,355	2,314	128,355	127,553	127,553

Table Rec 1 (p. 2 of 4)

Table 7-xx. Estimated West Coast recreational ocean angler effort by state, region, boat type and species target in 2005, 2006, 2007 and projected under each state's management options (angler trips) (page 2 of 4).

State	Region	Boat Type / Trip Target	2005	2006	2007	SQ (2008)	OR OP 1	OR OP 2	OR OP 3	OR OP 3a	OR OP 4	OR OP 5	OR OP 5a	OR OP 6
OREGON														
	Astoria-Tillamook													
		Charter												
		Halibut	1,502	1,417	1,544	1,439	0	1,322	1,322	661	1,322	1,322	661	1,322
		Salmon	2,800	2,441	3,213	715	0	3,324	3,324	3,324	3,324	3,324	3,324	3,324
		Bottomfish	5,139	5,116	4,411	4,835	0	4,220	5,260	5,260	5,260	5,260	5,260	5,260
		Combo	494	176	507	461	0	461	461	461	461	461	461	461
		Tuna	157	146	431	214	214	214	214	214	214	214	214	214
		Other	168	123	58	9	0	9	9	9	9	9	9	9
		TOTAL	10,260	9,419	10,164	7,674	214	9,550	10,590	9,929	10,590	10,590	9,929	10,590
		Private												
		Halibut	1,867	2,308	1,666	1,958	0	1,798	1,798	899	1,798	1,798	899	1,798
		Salmon	19,793	19,669	26,379	5,640	0	26,216	26,216	26,216	26,216	26,216	26,216	26,216
		Bottomfish	6,169	5,672	4,235	4,645	0	4,054	5,054	5,054	5,054	5,054	5,054	5,054
		Combo	2,302	1,722	3,328	2,653	0	2,653	2,653	2,653	2,653	2,653	2,653	2,653
		Tuna	357	910	1,845	852	852	852	852	852	852	852	852	852
		Other	1,334	1,025	834	100	0	100	100	100	100	100	100	100
		TOTAL	31,822	31,306	38,287	15,847	852	35,673	36,672	35,773	36,672	36,672	35,773	36,672
	Newport													
		Charter												
		Halibut	2,473	2,934	2,591	2,723	0	2,501	2,501	1,250	2,501	2,501	1,250	2,501
		Salmon	3,109	2,459	4,378	1,067	0	4,958	4,958	4,958	4,958	4,958	4,958	4,958
		Bottomfish	22,333	22,272	21,999	21,133	0	18,443	22,990	22,990	22,990	22,990	22,990	22,990
		Combo	664	531	1,118	866	0	866	866	866	866	866	866	866
		Tuna	762	740	2,148	1,139	1,139	1,139	1,139	1,139	1,139	1,139	1,139	1,139
		Other	3	33	12	2	0	2	2	2	2	2	2	2
		TOTAL	29,344	28,969	32,246	26,930	1,139	27,909	32,456	31,205	32,456	32,456	31,205	32,456
		Private												
		Halibut	8,110	8,535	9,826	8,653	0	7,946	7,946	3,973	7,946	7,946	3,973	7,946
		Salmon	6,519	5,875	11,190	2,563	0	11,916	11,916	11,916	11,916	11,916	11,916	11,916
		Bottomfish	7,157	6,832	4,760	5,736	0	5,006	6,240	6,240	6,240	6,240	6,240	6,240
		Combo	3,137	1,531	3,939	3,086	0	3,086	3,086	3,086	3,086	3,086	3,086	3,086
		Tuna	994	1,031	4,074	1,793	1,793	1,793	1,793	1,793	1,793	1,793	1,793	1,793
		Other	1,519	1,471	1,624	128	0	128	128	128	128	128	128	128
		TOTAL	27,436	25,275	35,413	21,959	1,793	29,875	31,109	27,136	31,109	31,109	27,136	31,109
	Coos Bay													
		Charter												
		Halibut	509	610	657	663	0	608	608	304	608	608	304	608
		Salmon	2,427	1,970	1,946	536	0	2,489	2,489	2,489	2,489	2,489	2,489	2,489
		Bottomfish	4,172	4,544	4,694	4,432	0	3,868	4,822	4,822	4,822	4,822	4,822	4,822
		Combo	131	37	7	91	0	91	91	91	91	91	91	91
		Tuna	91	93	305	189	189	189	189	189	189	189	189	189
		Other	18	26	15	2	0	2	2	2	2	2	2	2
		TOTAL	7,348	7,280	7,624	5,913	189	7,249	8,202	7,898	8,202	8,202	7,898	8,202
		Private												
		Halibut	1,421	1,086	1,696	1,444	0	1,326	1,326	663	1,326	1,326	663	1,326
		Salmon	20,033	14,989	19,448	4,807	0	22,347	22,347	22,347	22,347	22,347	22,347	22,347
		Bottomfish	5,355	6,507	6,555	5,393	0	4,707	5,867	5,867	5,867	5,867	5,867	5,867
		Combo	2,016	1,175	1,546	1,591	0	1,591	1,591	1,591	1,591	1,591	1,591	1,591
		Tuna	33	233	2,244	801	801	801	801	801	801	801	801	801
		Other	3,398	2,333	1,405	222	0	222	222	222	222	222	222	222
		TOTAL	32,256	26,323	32,894	14,258	801	30,994	32,154	31,491	32,154	32,154	31,491	32,154
	Brookings													
		Charter												
		Halibut	23	23	0	27	0	25	25	13	25	25	13	25
		Salmon	248	189	184	64	0	298	298	298	298	298	298	298
		Bottomfish	4,596	3,909	4,507	4,300	0	3,753	4,678	4,678	4,678	4,678	4,678	4,678
		Combo	33	75	3	52	0	52	52	52	52	52	52	52
		Tuna	12	0	88	53	53	53	53	53	53	53	53	53
		Other	69	56	5	4	0	4	4	4	4	4	4	4
		TOTAL	4,981	4,252	4,787	4,501	53	4,185	5,110	5,098	5,110	5,110	5,098	5,110
		Private												
		Halibut	71	81	0	76	0	70	70	35	70	70	35	70
		Salmon	9,972	8,216	9,585	2,308	0	10,731	10,731	10,731	10,731	10,731	10,731	10,731
		Bottomfish	16,506	16,822	15,504	15,123	0	13,199	16,452	16,452	16,452	16,452	16,452	16,452
		Combo	2,326	2,141	1,341	2,121	0	2,121	2,121	2,121	2,121	2,121	2,121	2,121
		Tuna	49	195	945	437	437	437	437	437	437	437	437	437
		Other	1,261	1,515	1,440	116	0	116	116	116	116	116	116	116
		TOTAL	30,185	28,970	28,815	20,182	437	26,674	29,928	29,893	29,928	29,928	29,893	29,928
OREGON TOTALS														
		Charter	51,933	49,920	54,821	45,017	1,595	48,893	56,359	54,131	56,359	56,359	54,131	56,359
		Private	121,699	111,674	135,409	72,247	3,883	123,215	129,863	124,293	129,863	129,863	124,293	129,863
		TOTAL	173,632	161,794	190,230	117,264	5,478	172,108	186,222	178,424	186,222	186,222	178,424	186,222

Table Rec 1 (p. 3 of 4)

Table 7-xx. Estimated West Coast recreational ocean angler effort by state, region, boat type and species target in 2005, 2006, 2007 and projected under each state's management options (angler trips) (page 3 of 4).

State	Region	Boat Type / Trip Target	2005	2006	2007	No Action (SQ)	CA OP 0	CA OP 1	CA OP 2	CA OP 3	CA OP 4	CA OP 5	CA OP 6
CALIFORNIA													
	North Coast: Humboldt and Del Norte counties												
		Charter											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	302	651	1,245	733	0	306	450	511	609	671	609
		Bottomfish	1,050	2,117	3,154	2,107	0	558	1,271	1,537	1,828	1,951	1,828
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	876	547	614	0	0	0	0	0	0	0	0
		Other	0	0	5	2	0	0	1	2	2	2	2
		TOTAL	2,228	3,316	5,018	2,841	0	864	1,722	2,050	2,439	2,623	2,439
		Private											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	22,544	22,879	22,430	22,618	0	9,454	13,895	15,775	18,797	20,707	18,797
		Bottomfish	15,230	15,940	16,113	15,759	0	4,173	9,506	11,502	13,677	14,591	13,677
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	17,320	35,531	29,401	436	1	1	401	424	425	431	425
		Other	509	459	594	520	0	31	234	487	519	519	519
		TOTAL	55,604	74,809	68,539	39,333	1	13,659	24,035	28,188	33,417	36,249	33,417
	North-Central Coast: Mendocino county												
		Charter											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	0	0	0	0	0	0	0	0	0	0	0
		Bottomfish	788	0	1,661	872	0	32	32	149	149	266	525
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		TOTAL	788	0	1,661	872	0	32	32	149	149	266	525
		Private											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	31,106	18,073	13,756	16,768	0	5,267	5,267	8,207	8,207	11,146	16,396
		Bottomfish	7,910	8,614	9,271	8,429	0	311	311	1,440	1,440	2,570	5,076
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	2	58	1,668	576	0	0	0	279	279	557	576
		Other	121	11	57	62	0	5	5	12	12	19	29
		TOTAL	39,139	26,756	24,752	25,833	0	5,583	5,583	9,938	9,938	14,292	22,077
	North-Central Coast: San Mateo County through Sonoma County												
		Charter											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	11,730	51	4,750	4,778	0	3,587	4,398	4,398	4,398	4,398	4,398
		Bottomfish	16,258	46,209	24,156	27,693	0	18,376	23,653	23,653	23,653	23,653	23,653
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	0	0	0	0	0	0	0	0	0	0	0
		Other	1,935	64	695	636	0	524	595	595	595	595	595
		TOTAL	29,924	46,324	29,601	33,107	0	22,488	28,646	28,646	28,646	28,646	28,646
		Private											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	63,779	46,271	26,376	38,429	0	29,606	36,294	36,294	36,294	36,294	36,294
		Bottomfish	23,104	37,894	21,764	26,458	0	17,557	22,599	22,599	22,599	22,599	22,599
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	988	1,441	1,813	1,411	919	919	1,407	1,407	1,407	1,407	1,407
		Other	44,589	52,407	35,897	31,385	0	25,839	29,359	29,359	29,359	29,359	29,359
		TOTAL	132,460	138,012	85,850	98,683	919	73,922	89,659	89,659	89,659	89,659	89,659

Table Rec 1 (p. 4 of 4)

Table 7-xx Estimated West Coast recreational ocean angler effort by state, region, boat type and species target in 2005, 2006, 2007 and projected under each state's management options (angler trips) (page 4 of 4).

State	Region	Boat Type / Trip Target	2005	2006	2007	No Action (SQ)	CA OP 0	CA OP 1	CA OP 2	CA OP 3	CA OP 4	CA OP 5	CA OP 6
CALIFORNIA													
	South-Central Coast: San Luis Obispo County through Santa Cruz County												
		Charter											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	1,745	229	1,628	708	0	708	708	708	708	708	708
		Bottomfish	22,037	26,456	31,920	26,244	0	24,731	24,731	24,731	24,731	24,731	26,244
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	0	0	0	0	0	0	0	0	0	0	0
		Other	609	490	8,891	3,147	0	3,121	3,121	3,121	3,121	3,121	3,147
		TOTAL	24,391	27,175	42,439	30,099	0	28,559	28,559	28,559	28,559	28,559	30,099
		Private											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	42,096	23,894	31,743	19,208	0	19,208	19,208	19,208	19,208	19,208	19,208
		Bottomfish	30,798	40,367	36,364	35,094	0	33,071	33,071	33,071	33,071	33,071	35,094
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	1,055	1,674	2,763	1,831	1,820	1,820	1,820	1,820	1,820	1,820	1,831
		Other	11,822	9,318	9,223	9,564	0	9,484	9,484	9,484	9,484	9,484	9,564
		TOTAL	85,771	75,253	80,093	65,697	1,820	63,583	63,583	63,583	63,583	63,583	65,697
	South Coast: Ventura and Santa Barbara counties												
		Charter											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	0	0	0	0	0	0	0	0	0	0	0
		Bottomfish	27,798	17,784	32,673	25,423	0	25,423	25,423	25,423	25,423	25,423	25,423
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	0	16	0	5	5	5	5	5	5	5	5
		Other	3,319	3,448	1,967	2,752	0	2,752	2,752	2,752	2,752	2,752	2,752
		TOTAL	31,117	21,247	34,640	28,181	5	28,181	28,181	28,181	28,181	28,181	28,181
		Private											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	1,869	1,104	1,341	1,438	0	1,438	1,438	1,438	1,438	1,438	1,438
		Bottomfish	24,422	19,648	19,778	20,743	0	20,743	20,743	20,743	20,743	20,743	20,743
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	66	115	1,174	446	446	446	446	446	446	446	446
		Other	13,936	15,865	19,970	15,686	0	15,686	15,686	15,686	15,686	15,686	15,686
		TOTAL	40,294	36,732	42,262	38,313	446	38,313	38,313	38,313	38,313	38,313	38,313
	South Coast: San Diego County through Los Angeles County												
		Charter											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	825	0	174	333	0	333	333	333	333	333	333
		Bottomfish	181,247	99,234	139,253	131,708	0	131,708	131,708	131,708	131,708	131,708	131,708
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	876	531	614	670	670	670	670	670	670	670	670
		Other	92,046	65,897	57,675	68,554	0	68,554	68,554	68,554	68,554	68,554	68,554
		TOTAL	274,995	165,662	197,716	201,265	670	201,265	201,265	201,265	201,265	201,265	201,265
		Private											
		Halibut	0	0	0	0	0	0	0	0	0	0	0
		Salmon	0	0	0	0	0	0	0	0	0	0	0
		Bottomfish	141,206	129,557	163,800	136,361	0	136,361	136,361	136,361	136,361	136,361	136,361
		Combo	0	0	0	0	0	0	0	0	0	0	0
		HMS	15,205	32,224	20,697	22,579	22,579	22,579	22,579	22,579	22,579	22,579	22,579
		Other	276,767	324,879	223,799	262,442	0	262,442	262,442	262,442	262,442	262,442	262,442
		TOTAL	433,178	486,660	408,295	421,382	22,579	421,382	421,382	421,382	421,382	421,382	421,382
CALIFORNIA TOTALS													
		Charter	363,442	263,725	311,295	296,364	675	281,389	288,405	288,850	289,239	289,540	291,155
		Private	786,445	838,221	709,792	689,241	25,765	616,441	642,555	651,062	656,292	663,478	670,545
		TOTAL	1,149,887	1,101,946	1,021,087	985,605	26,441	897,830	930,960	939,912	945,531	953,018	961,699

Table Rec 2 (p. 1 of 4)

Table 7-xx. Estimated West Coast income impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2005, 2006 and 2007, and projected income impacts under the management alternatives (million $) (page 1 of 4) (Income impacts are a measure of local value added generated by the expenditures associated with recreational fishing activities).

State	Region	Boat Type / Trip Target	2005	2006	2007	SQ (2008)	WA OP 0	WA OP 1	WA OP 2	WA OP 3
WASHINGTON										
	North Washington Coast									
		Charter								
		Halibut	0.2	0.2	0.2	0.2	0.0	0.2	0.2	0.2
		Salmon	0.4	0.2	0.2	0.3	0.0	0.3	0.3	0.3
		Bottomfish	0.1	0.1	0.1	0.2	0.0	0.2	0.2	0.2
		Salm/Hlbt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	0.7	0.5	0.5	0.7	0.0	0.7	0.7	0.7
		Private								
		Halibut	0.2	0.2	0.2	0.2	0.0	0.2	0.2	0.2
		Salmon	0.4	0.3	0.3	0.4	0.0	0.4	0.4	0.4
		Bottomfish	0.2	0.1	0.2	0.2	0.0	0.2	0.1	0.1
		Salm/Hlbt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	0.7	0.6	0.7	0.7	0.0	0.7	0.7	0.7
	South & Central WA Coast									
		Charter								
		Halibut	0.7	0.6	0.6	0.6	0.0	0.6	0.6	0.6
		Salmon	6.3	5.1	5.6	6.1	0.0	6.1	6.1	6.1
		Bottomfish	2.8	3.4	3.1	3.1	0.0	3.1	3.1	3.1
		Salm/Hlbt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.3
		TOTAL	10.1	9.4	9.6	10.0	0.3	10.0	10.0	10.0
		Private								
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	2.2	1.4	1.7	2.1	0.0	2.1	2.1	2.1
		Bottomfish	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
		Salm/Hlbt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
		TOTAL	2.3	1.5	1.8	2.2	0.0	2.2	2.2	2.2
WASHINGTON TOTALS										
		Charter	10.8	9.9	10.1	10.7	0.3	10.7	10.7	10.7
		Private	3.0	2.2	2.5	2.9	0.0	2.9	2.9	2.9
		TOTAL	13.8	12.1	12.6	13.6	0.3	13.6	13.6	13.6

Table Rec 2 (p. 2 of 4)

Table 7-xx Estimated West Coast Income Impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2005, 2006 and 2007, and projected income impacts under the management alternatives (million $) (page 2 of 4) (Income impacts are a measure of local value added generated by the expenditures associated with recreational fishing activities).

State	Region	Boat Type / Trip Target	2005	2006	2007	SQ (2008)	OR OP 1	OR OP 2	OR OP 3	OR OP 3a	OR OP 4	OR OP 5	OR OP 5a	OR OP 6
OREGON														
	Astoria-Tillamook													
		Charter												
		Halibut	0.2	0.2	0.2	0.2	0.0	0.2	0.2	0.1	0.2	0.2	0.1	0.2
		Salmon	0.5	0.4	0.5	0.1	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		Bottomfish	0.8	0.8	0.7	0.8	0.0	0.7	0.8	0.8	0.8	0.8	0.8	0.8
		Combo	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Tuna	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	1.7	1.5	1.6	1.2	0.0	1.5	1.7	1.6	1.7	1.7	1.6	1.7
		Private												
		Halibut	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1
		Salmon	0.9	0.9	1.1	0.2	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
		Bottomfish	0.3	0.2	0.2	0.2	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		Combo	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Tuna	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	1.4	1.4	1.7	0.7	0.0	1.5	1.6	1.5	1.6	1.6	1.5	1.6
	Newport													
		Charter												
		Halibut	0.4	0.5	0.4	0.4	0.0	0.4	0.4	0.2	0.4	0.4	0.2	0.4
		Salmon	0.5	0.4	0.7	0.2	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8
		Bottomfish	3.6	3.6	3.5	3.4	0.0	3.0	3.7	3.7	3.7	3.7	3.7	3.7
		Combo	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Tuna	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	4.7	4.7	5.2	4.3	0.2	4.5	5.2	5.0	5.2	5.2	5.0	5.2
		Private												
		Halibut	0.4	0.4	0.4	0.4	0.0	0.3	0.3	0.2	0.3	0.3	0.2	0.3
		Salmon	0.3	0.3	0.5	0.1	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		Bottomfish	0.3	0.3	0.2	0.2	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3
		Combo	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Tuna	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Other	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	1.2	1.1	1.5	0.9	0.1	1.3	1.3	1.2	1.3	1.3	1.2	1.3
	Coos Bay													
		Charter												
		Halibut	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1
		Salmon	0.4	0.3	0.3	0.1	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		Bottomfish	0.7	0.7	0.8	0.7	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	1.2	1.2	1.2	1.0	0.0	1.2	1.3	1.3	1.3	1.3	1.3	1.3
		Private												
		Halibut	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1
		Salmon	0.9	0.6	0.8	0.2	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Bottomfish	0.2	0.3	0.3	0.2	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3
		Combo	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Tuna	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	1.4	1.1	1.4	0.6	0.0	1.3	1.4	1.4	1.4	1.4	1.4	1.4
	Brookings													
		Charter												
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	0.7	0.6	0.7	0.7	0.0	0.6	0.8	0.8	0.8	0.8	0.8	0.8
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	0.8	0.7	0.8	0.7	0.0	0.7	0.8	0.8	0.8	0.8	0.8	0.8
		Private												
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.4	0.4	0.4	0.1	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		Bottomfish	0.7	0.7	0.7	0.7	0.0	0.6	0.7	0.7	0.7	0.7	0.7	0.7
		Combo	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Tuna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	1.3	1.3	1.2	0.9	0.0	1.2	1.3	1.3	1.3	1.3	1.3	1.3
OREGON TOTALS														
		Charter	8.4	8.0	8.8	7.3	0.3	7.9	9.1	8.7	9.1	9.1	8.7	9.1
		Private	5.3	4.8	5.9	3.1	0.2	5.3	5.6	5.4	5.6	5.6	5.4	5.6
		TOTAL	13.6	12.9	14.7	10.4	0.4	13.2	14.7	14.1	14.7	14.7	14.1	14.7

Table Rec 2 (p. 3 of 4)

Table 7-xx. Estimated West Coast Income impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2005, 2006 and 2007, and projected income impacts under the management alternatives (million $) (page 3 of 4) (Income impacts are a measure of local value added generated by the expenditures associated with recreational fishing activities).

State	Region	Boat Type / Trip Target	2005	2006	2007	CA OP 1 (SQ)	CA OP 0	CA OP 2	CA OP 3	CA OP 4	CA OP 5	CA OP 6	CA OP 7
CALIFORNIA													
	North Coast: Humboldt and Del Norte counties												
		Charter											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.0	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
		Bottomfish	0.2	0.3	0.5	0.3	0.0	0.1	0.2	0.2	0.3	0.3	0.3
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	0.3	0.5	0.8	0.4	0.0	0.1	0.3	0.3	0.4	0.4	0.4
		Private											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	1.0	1.0	1.0	1.0	0.0	0.4	0.6	0.7	0.8	0.9	0.8
		Bottomfish	0.7	0.7	0.7	0.7	0.0	0.2	0.4	0.5	0.6	0.6	0.6
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.8	1.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	2.5	3.3	3.0	1.7	0.0	0.6	1.1	1.3	1.5	1.6	1.5
	North-Central Coast: Mendocino county												
		Charter											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	0.1	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	0.1	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		Private											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	1.4	0.8	0.8	0.7	0.0	0.2	0.2	0.4	0.4	0.5	0.7
		Bottomfish	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.1	0.1	0.1	0.2
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	1.7	1.2	1.1	1.1	0.0	0.2	0.2	0.4	0.4	0.6	1.0
	North-Central Coast: San Mateo County through Sonoma County												
		Charter											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	1.8	0.0	0.7	0.7	0.0	0.5	0.7	0.7	0.7	0.7	0.7
		Bottomfish	2.4	6.9	3.6	4.1	0.0	2.7	3.5	3.5	3.5	3.5	3.5
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.3	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
		TOTAL	4.5	6.9	4.4	5.0	0.0	3.4	4.3	4.3	4.3	4.3	4.3
		Private											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	2.8	2.1	1.2	1.8	0.0	1.3	1.6	1.6	1.6	1.6	1.6
		Bottomfish	1.0	1.7	1.0	1.2	0.0	0.8	1.0	1.0	1.0	1.0	1.0
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
		Other	2.0	2.3	1.6	1.4	0.0	1.1	1.3	1.3	1.3	1.3	1.3
		TOTAL	5.9	6.1	3.8	4.4	0.0	3.3	4.0	4.0	4.0	4.0	4.0

Table Rec 2 (p. 4 of 4)

Table 7-xx. Estimated West Coast income impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2005, 2006 and 2007, and projected income impacts under the management alternatives (million $) (page 4 of 4) (Income impacts are a measure of local value added generated by the expenditures associated with recreational fishing activities).

State	Region	Boat Type / Trip Target	2005	2006	2007	CA OP 1 (SQ)	CA OP 0	CA OP 2	CA OP 3	CA OP 4	CA OP 5	CA OP 6	CA OP 7
CALIFORNIA													
	South-Central Coast: San Luis Obispo County through Santa Cruz County												
		Charter											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.2	0.0	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
		Bottomfish	2.7	3.2	3.9	3.2	0.0	3.0	3.0	3.0	3.0	3.0	3.2
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.1	0.1	1.1	0.4	0.0	0.4	0.4	0.4	0.4	0.4	0.4
		TOTAL	3.0	3.3	5.2	3.7	0.0	3.5	3.5	3.5	3.5	3.5	3.7
		Private											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	1.7	1.0	1.3	0.8	0.0	0.8	0.8	0.8	0.8	0.8	0.8
		Bottomfish	1.3	1.7	1.5	1.4	0.0	1.4	1.4	1.4	1.4	1.4	1.4
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Other	0.5	0.4	0.4	0.4	0.0	0.4	0.4	0.4	0.4	0.4	0.4
		TOTAL	3.5	3.1	3.3	2.7	0.1	2.6	2.6	2.6	2.6	2.6	2.7
	South Coast: Ventura and Santa Barbara counties												
		Charter											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	3.4	2.2	4.0	3.1	0.0	3.1	3.1	3.1	3.1	3.1	3.1
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.4	0.4	0.2	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.3
		TOTAL	3.8	2.6	4.2	3.5	0.0	3.5	3.5	3.5	3.5	3.5	3.5
		Private											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
		Bottomfish	1.0	0.8	0.8	0.8	0.0	0.8	0.8	0.8	0.8	0.8	0.8
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	0.6	0.6	0.8	0.6	0.0	0.6	0.6	0.6	0.6	0.6	0.6
		TOTAL	1.6	1.5	1.7	1.6	0.0	1.6	1.6	1.6	1.6	1.5	1.6
	South Coast: San Diego County through Los Angeles County												
		Charter											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	22.2	12.2	17.1	16.2	0.0	16.2	16.2	16.2	16.2	16.2	16.2
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Other	11.3	8.1	7.1	8.4	0.0	8.4	8.4	8.4	8.4	8.4	8.4
		TOTAL	33.7	20.3	24.3	24.7	0.1	24.7	24.7	24.7	24.7	24.7	24.7
		Private											
		Halibut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	5.8	5.3	6.7	5.6	0.0	5.6	5.6	5.8	5.8	5.6	5.8
		Combo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	0.6	1.3	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
		Other	11.3	13.3	9.2	10.7	0.0	10.7	10.7	10.7	10.7	10.7	10.7
		TOTAL	17.7	19.9	16.7	17.2	0.9	17.2	17.2	17.2	17.2	17.2	17.2
CALIFORNIA TOTALS													
		Charter	45.5	33.7	39.2	37.3	0.1	35.1	36.2	36.3	36.3	36.4	36.6
		Private	33.0	35.1	29.6	28.8	1.1	25.5	26.7	27.1	27.3	27.6	27.9
		TOTAL	78.4	68.8	68.8	66.1	1.1	60.7	62.9	63.3	63.6	64.0	64.5

Table Rec 3 (p. 1 of 4)

Table 7-xx. Change in estimated West Coast recreational ocean angler **income impacts** by state, region, boat type and species target compared with No Action / Status Quo under each state's management options (million $) (page 1 of 4).

State	Region	Boat Type / Trip Target	SQ (2008)	WA OP 0	WA OP 1	WA OP 2	WA OP 3
WASHINGTON							
	North Washington Coast						
		Charter					
		Halibut	*0.2*	-0.2	0.0	0.0	0.0
		Salmon	*0.3*	-0.3	0.0	0.0	0.0
		Bottomfish	*0.2*	-0.2	0.0	0.0	0.0
		Salm/Hlbt	*0.0*	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0
		TOTAL	*0.7*	-0.7	0.0	0.0	0.0
		Private					
		Halibut	*0.2*	-0.2	0.0	0.0	0.0
		Salmon	*0.4*	-0.4	0.0	0.0	0.0
		Bottomfish	*0.2*	-0.2	0.0	0.0	0.0
		Salm/Hlbt	*0.0*	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0
		TOTAL	*0.7*	-0.7	0.0	0.0	0.0
	South & Central WA Coast						
		Charter					
		Halibut	*0.6*	-0.6	0.0	0.0	0.0
		Salmon	*6.1*	-6.1	0.0	0.0	0.0
		Bottomfish	*3.1*	-3.1	0.0	0.0	0.0
		Salm/Hlbt	*0.0*	0.0	0.0	0.0	0.0
		Tuna	*0.3*	0.0	0.0	0.0	0.0
		TOTAL	*10.0*	-9.7	0.0	0.0	0.0
		Private					
		Halibut	*0.0*	0.0	0.0	0.0	0.0
		Salmon	*2.1*	-2.1	0.0	0.0	0.0
		Bottomfish	*0.1*	-0.1	0.0	0.0	0.0
		Salm/Hlbt	*0.0*	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0
		TOTAL	*2.2*	-2.2	0.0	0.0	0.0
WASHINGTON TOTALS							
		Charter	*10.7*	-10.4	0.0	0.0	0.0
		Private	*2.9*	-2.9	0.0	0.0	0.0
		TOTAL	*13.6*	-13.3	0.0	0.0	0.0

Table Rec 3 (p. 2 of 4)

Table 7-xx. Change in estimated West Coast recreational ocean angler **income impacts** by state, region, boat type and species target compared with No Action / Status Quo under each state's management options (million $) (page 2 of 4).

State	Region	Boat Type / Trip Target	SQ (2008)	OR OP 1	OR OP 2	OR OP 3	OR OP 3a	OR OP 4	OR OP 5	OR OP 5a	OR OP 6
OREGON											
	Astoria-Tillamook										
		Charter									
		Halibut	*0.2*	-0.2	0.0	0.0	-0.1	0.0	0.0	-0.1	0.0
		Salmon	*0.1*	-0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		Bottomfish	*0.8*	-0.8	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Combo	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*1.2*	-1.2	0.3	0.5	0.4	0.5	0.5	0.4	0.5
		Private									
		Halibut	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.2*	-0.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9
		Bottomfish	*0.2*	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Combo	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*0.7*	-0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	Newport										
		Charter									
		Halibut	*0.4*	-0.4	0.0	0.0	-0.2	0.0	0.0	-0.2	0.0
		Salmon	*0.2*	-0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		Bottomfish	*3.4*	-3.4	-0.4	0.3	0.3	0.3	0.3	0.3	0.3
		Combo	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.2*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*4.3*	-4.2	0.2	0.9	0.7	0.9	0.9	0.7	0.9
		Private									
		Halibut	*0.4*	-0.4	0.0	0.0	-0.2	0.0	0.0	-0.2	0.0
		Salmon	*0.1*	-0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		Bottomfish	*0.2*	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Combo	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.1*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*0.9*	-0.9	0.3	0.4	0.2	0.4	0.4	0.2	0.4
	Coos Bay										
		Charter									
		Halibut	*0.1*	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.1	0.0
		Salmon	*0.1*	-0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		Bottomfish	*0.7*	-0.7	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*1.0*	-0.9	0.2	0.4	0.3	0.4	0.4	0.3	0.4
		Private									
		Halibut	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.2*	-0.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8
		Bottomfish	*0.2*	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Combo	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*0.6*	-0.6	0.7	0.8	0.7	0.8	0.8	0.7	0.8
	Brookings										
		Charter									
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*0.7*	-0.7	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*0.7*	-0.7	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Private									
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.1*	-0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		Bottomfish	*0.7*	-0.7	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Combo	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Tuna	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*0.9*	-0.9	0.3	0.4	0.4	0.4	0.4	0.4	0.4
OREGON TOTALS											
		Charter	*7.3*	-7.0	0.6	1.8	1.5	1.8	1.8	1.5	1.8
		Private	*3.1*	-3.0	2.2	2.5	2.2	2.5	2.5	2.2	2.5
		TOTAL	*10.4*	-10.0	2.8	4.3	3.7	4.3	4.3	3.7	4.3

Table Rec 3 (p. 3 of 4)

Table 7-xx. Change in estimated West Coast recreational ocean angler income impacts by state, region, boat type and species target compared with No Action / Status Quo under each state's management options (million $) (page 3 of 4).

State	Region	Boat Type / Trip Target	*CA OP 1 (SQ)*	CA OP 0	CA OP 2	CA OP 3	CA OP 4	CA OP 5	CA OP 6	CA OP 7
CALIFORNIA										
	North Coast: Humboldt and Del Norte counties									
		Charter								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.1*	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*0.3*	-0.3	-0.2	-0.1	-0.1	0.0	0.0	0.0
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*0.4*	-0.4	-0.3	-0.2	-0.1	-0.1	0.0	-0.1
		Private								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*1.0*	-1.0	-0.6	-0.4	-0.3	-0.2	-0.1	-0.2
		Bottomfish	*0.7*	-0.7	-0.5	-0.3	-0.2	-0.1	-0.1	-0.1
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*1.7*	-1.7	-1.1	-0.7	-0.5	-0.3	-0.1	-0.3
	North-Central Coast: Mendocino county									
		Charter								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*0.1*	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*0.1*	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
		Private								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.7*	-0.7	-0.5	-0.5	-0.4	-0.4	-0.2	0.0
		Bottomfish	*0.4*	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.1
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*1.1*	-1.1	-0.9	-0.9	-0.7	-0.7	-0.5	-0.2
	North-Central Coast: San Mateo County through Sonoma County									
		Charter								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.7*	-0.7	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
		Bottomfish	*4.1*	-4.1	-1.4	-0.6	-0.6	-0.6	-0.6	-0.6
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*5.0*	-5.0	-1.6	-0.7	-0.7	-0.7	-0.7	-0.7
		Private								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*1.8*	-1.8	-0.4	-0.1	-0.1	-0.1	-0.1	-0.1
		Bottomfish	*1.2*	-1.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.1*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*1.4*	-1.4	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
		TOTAL	*4.4*	-4.3	-1.1	-0.4	-0.4	-0.4	-0.4	-0.4

Table Rec 3 (p. 4 of 4)

Table 7-xx. Change in estimated West Coast recreational ocean angler **Income Impacts** by state, region, boat type and species target compared with No Action / Status Quo under each state's management options (million $) (page 4 of 4).

State	Region	Boat Type / Trip Target	*CA OP 1 (SQ)*	CA OP 0	CA OP 2	CA OP 3	CA OP 4	CA OP 5	CA OP 6	CA OP 7
CALIFORNIA										
	South-Central Coast: San Luis Obispo County through Santa Cruz County									
		Charter								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*3.2*	-3.2	-0.2	-0.2	-0.2	-0.2	-0.2	0.0
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.4*	-0.4	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*3.7*	-3.7	-0.2	-0.2	-0.2	-0.2	-0.2	0.0
		Private								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.8*	-0.8	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*1.4*	-1.4	-0.1	-0.1	-0.1	-0.1	-0.1	0.0
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.1*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.4*	-0.4	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*2.7*	-2.6	-0.1	-0.1	-0.1	-0.1	-0.1	0.0
	South Coast: Ventura and Santa Barbara counties									
		Charter								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*3.1*	-3.1	0.0	0.0	0.0	0.0	0.0	0.0
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.3*	-0.3	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*3.5*	-3.5	0.0	0.0	0.0	0.0	0.0	0.0
		Private								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.1*	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*0.8*	-0.8	0.0	0.0	0.0	0.0	0.0	0.0
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*0.6*	-0.6	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*1.6*	-1.5	0.0	0.0	0.0	0.0	0.0	0.0
	South Coast: San Diego County through Los Angeles County									
		Charter								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*16.2*	-16.2	0.0	0.0	0.0	0.0	0.0	0.0
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.1*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*8.4*	-8.4	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*24.7*	-24.6	0.0	0.0	0.0	0.0	0.0	0.0
		Private								
		Halibut	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Salmon	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Bottomfish	*5.6*	-5.6	0.0	0.0	0.0	0.0	0.0	0.0
		Combo	*0.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		HMS	*0.9*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Other	*10.7*	-10.7	0.0	0.0	0.0	0.0	0.0	0.0
		TOTAL	*17.2*	-16.3	0.0	0.0	0.0	0.0	0.0	0.0
CALIFORNIA TOTALS										
		Charter	*37*	-37	-2	-1	-1	-1	-1	-1
		Private	*29*	-28	-3	-2	-2	-1	-1	-1
		TOTAL	*66*	-65	-5	-3	-3	-2	-2	-2

California Department of Fish and Game Preferred Recreational and Commercial Fishery Management Measures for the 2009-2010 Season

California Department of Fish and Game (CDFG) will continue recreational management measures described under the status quo alternative (Agenda Item F.4.a, Attachment 1, Ch. 2 Section 2.2.4.1, pgs. 72, 87) regarding area closures, bag limits, etc with the following exceptions to the season and depth changes described below and other measures. In all management areas, under California laws, divers and shore-based anglers would continue to be exempt from the seasonal closures and depth restrictions. Additionally, California would continue to provide an exemption to allow year-round fishing for leopard sharks in specified enclosed bays and estuaries. California would also continue to provide for retention and possession of sanddabs and “other flatfishes” during the seasonal and depth closures that generally apply to all federal groundfish. The state would also continue with the prohibition on recreational groundfish fishing inside 10 fathoms at the Farallon Islands and other previously identified areas.

Exceptions to the Status Quo 2007-2008 regulations include:

<u>Preliminary Preferred Alternative for Season Length and Depth Restrictions for the 2009-2010 California Recreational Fishery by Management Area</u>

The season and depth restrictions in Figure 1 are the result of efforts to minimize impacts on constraining species while maximizing fishing opportunity in each management area. Yelloweye rockfish is the most constraining species in the Northern and North-Central North of Point Arena Management Areas. In the Morro Bay South-Central Management Area, Monterey South-Central Management Area and North-Central South of Pt. Arena Management Area blue rockfish is the most constraining species. In the Southern Management Area, cowcod and bocaccio are the most constraining species. The impacts resulting from the preferred alternative are provided in Table 1.

<table>
<tr><th>Management Area</th><th colspan="2">Jan</th><th colspan="2">Feb</th><th colspan="2">Mar</th><th colspan="2">Apr</th><th colspan="2">May</th><th colspan="2">June</th><th colspan="2">July</th><th colspan="2">Aug</th><th colspan="2">Sep</th><th colspan="2">Oct</th><th colspan="2">Nov</th><th colspan="2">Dec</th></tr>
<tr><td>North</td><td colspan="9">CLOSED</td><td colspan="8">Open <20 fm, May 15 - Sept 15</td><td colspan="7">CLOSED</td></tr>
<tr><td>North-Central N. of Pt. Arena</td><td colspan="9">CLOSED</td><td colspan="6">Open <20 fm, May 15 - Aug 15</td><td colspan="9">CLOSED</td></tr>
<tr><td>North-Central S. of Pt. Arena</td><td colspan="11">CLOSED</td><td colspan="9">Open <30 fm, June 13 - Oct 31</td><td colspan="4">CLOSED</td></tr>
<tr><td>Monterey South-Central</td><td colspan="8">CLOSED</td><td colspan="13">Open <40 fm, May 1 - Nov 15</td><td colspan="3">CLOSED</td></tr>
<tr><td>Morro Bay South-Central</td><td colspan="8">CLOSED</td><td colspan="13">Open <40 fm, May 1 - Nov 15</td><td colspan="3">CLOSED</td></tr>
<tr><td>South</td><td colspan="4">CLOSED</td><td colspan="20">Open <60 fm</td></tr>
</table>

Figure 1. Preferred Season and Depth Restrictions for the California Recreational Fishery for 2009-2010

Table 1. Projected Impacts for the California Recreational Fishery under the Preferred Alternative in Figure 1.

Species	Projected Catch (mt)	2010 Harvest Guideline (mt)	% of Harvest Guideline
Yelloweye	2.6	2.8	90.7%
Canary	6.9	24.4	28.3%
Bocaccio	67.3	87.6*	76.8%
Widow	6.21	10.3*	60.3%
Cowcod	0.1	0.3	33.3%
Blue	183	183**	100%

*Harvest Guideline calculated assuming the same proportions of the OY from the 2007-2008 specifications using the Council preferred OY alternatives.

**The recreational blue rockfish harvest guideline is the result of a recreational and commercial catch sharing agreement and does not reflect a permanent allocation between the sectors. The sum of the two modes will not exceed the 220 mt.

Subdivision of the North-Central Management Area: As described on page 107 of Agenda Item F.4.a, Supplemental Attachment 2, the CDFG proposes subdivision of the North-Central Management Area at Point Arena into what will be referred to as the North-Central North of Point Arena and North-Central South of Point Arena Management Areas (depicted in Figure 1). This action has been taken to minimize the spatial extent of restrictions to season and depth restrictions to reduce yelloweye rockfish impacts.

Increase Statewide Bag Limit for Cabezon from 1 to 2 Fish

The statewide bag limit for cabezon was 1 fish in the 2007-2008 season. CDFG analyzed the possibility of increasing the cabezon bag limit from 1 to 2 fish using the methods described in Agenda Item F.4.a, Supplemental Attachment 2. The statewide projected catch with the increase in the bag limit is 28 mt out of the 42 mt statewide recreational allocation.

Increase Bag Limit for Bocaccio from 1 to 2 Fish

The bag limit for bocaccio in the Northern Management Area was 2 fish in the 2007-2008 season and the Department recommends that this status quo bag limit remain in place. CDFG analyzed the possibility of increasing the bocaccio bag limit from 1 to 2 fish in the balance of the state using the methods described in Agenda Item F.4.a, Supplemental Attachment 2. Assuming a proportional increase in the recreational harvest guideline, with a 278 mt OY, the amount of bocaccio available to the recreational fishery would be 87.6 mt. The impacts projected for the recreational fishery with a 2 fish bag limit statewide is 67.3 mt, providing a buffer between the projected impacts and potential harvest guidelines. The Department proposes increasing the bag limit to 2 fish south of Cape Mendocino. Bocaccio are primarily encountered in depths deeper than 180 fms and the depth dependent mortality rates developed by the GMT ascribe a 100% mortality rate to fish discarded in depths greater than 30 fms. The proposed action would reduce impacts on other fish that would be caught to replace discarded fish and decrease wastage of discarded dead bocaccio.

Eliminate Gear Restrictions when Fishing for Sanddabs and Other Flatfish: CDFG has analyzed the efficacy of the gear restrictions implemented in 2004 in reducing impacts on overfished species while recreationally fishing for sanddabs and other flatfish. The analysis revealed that there has been no appreciable change to impact rates on overfished species and species of the genus *Sebastes* before and after gear restrictions were implemented and that impacts are presently negligible. The methods and results of this analysis are found in Agenda Item F.4.a, Supplemental Attachment 2 on page 109.

Adopt Modifications to Commercial Rockfish Conservation Area (RCA) Lines
CDFG provided adjustments to trawl and non-trawl RCA lines based on requests from industry and to correct errors in previous lines. These changes are provided in Agenda Item F.4.b, Supplemental CDFG Report 4, June 2008.

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT DETAILING THE PREFERRED ALTERNATIVE FOR MANAGEMENT OF THE OREGON RECREATIONAL AND COMMERCIAL GROUNDFISH FISHERIES IN 2009 AND 2010

This report details Oregon Department of Fish and Wildlife's (ODFW) preferred management measures for the 2009 and 2010 recreational and commercial groundfish fisheries. ODFW recommends the Council adopt the following management measures:

RECREATIONAL

ODFW recommends adoption of Alternative 6 (described in Chapter 2 of the preliminary Draft EIS, p. 88), as modified in this report, for the Oregon recreational groundfish fishery in 2009 and 2010.

The preferred season structure (Table 1) for 2009 and 2010 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 (fm). Estimated impacts for yelloweye rockfish and canary rockfish associated with this preferred alternative are 2.5 mt for each species.

Table 1**:** ODFW preferred 2009-2010 Oregon recreational groundfish fishery management measures.

Month												OR Sport Yelloweye RF (mt)	OR Sport Canary RF (mt)	Marine Bag Limit *	Lingcod Bag Limit
J	F	M	A	M	J	J	A	S	O	N	D				
Open all depth			Open <40 fm 4/1-9/30						Open all depth			2.5	2.5	10	3

* 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

Marine Fish Daily Bag Limit: ODFW recommends adoption of a marine fish daily bag limit of 10 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 are nearshore rockfish including black rockfish. The fishery will be managed within the black rockfish harvest guideline.

Lingcod Daily Bag Limit: ODFW recommends adoption of a lingcod daily bag limit of 3 fish. This will provide management flexibility to make inseason adjustments to the lingcod daily bag limit through state rules if either the Pacific halibut catch limit is less than in 2008 or the marine bag limit is adjusted inseason.

Flatfish Daily Bag Limit: ODFW recommends maintaining a flatfish daily bag limit of 25 fish in aggregate (excluding Pacific halibut).

Minimum Length Limits: ODFW recommends maintaining the existing length limits in place for 2007-08; 22-inches for lingcod; 16-inches for cabezon; and 10-inches for kelp greenling.

Stonewall Bank YRCA: ODFW recommends maintaining the existing Stonewall Bank YRCA 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. This same area is closed to the retention of Pacific halibut. Targeting and retention of Pacific halibut and groundfish would be prohibited in the area year-round.

Table 2. Location of the 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	25.50

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 2009 and 2010.

Inseason Management: The inseason actions that may be implemented if the 2009 or 2010 Oregon recreational groundfish fishery does not proceed as expected include: length limit adjustments, bag limit adjustments (including non retention), gear restrictions, and season, depth, days per week and area closures.

Depth management will be the main inseason tool for controlling yelloweye rockfish and canary 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 yelloweye rockfish and canary 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 yelloweye or canary 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 to no more than 10 fish may be implemented to achieve season duration goals in the event of accelerated or decelerated black rockfish or other nearshore rockfish harvest. The lingcod daily bag limits may be adjusted to no more than 3 fish in the event the marine bag limit changes or the halibut catch limit is reduced from 2008 levels. 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 and other nearshore rockfish species.

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 and will continue into 2009-10, 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 rockfish 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; the nearshore waters are closed to groundfish fishing due to management of nearshore species; or the Pacific halibut catch limit is reduced from 2008 levels, 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 rockfish and canary rockfish are not in excess of the harvest targets.

COMMERCIAL

Limited Entry Whiting Trawl

<u>Changing the At-Sea Processing Restrictions in the Shoreside Whiting Fishery</u>

ODFW recommends modifying whiting regulations to allow tailing in addition to heading and gutting in the shoreside whiting fishery for vessels that are 75 ft. in length or less. Also, ODFW recommends these vessels be required to provide 100% observer coverage.

This action could provide increased economic incentives by allowing a value-added product to be landed. At least one market has been established with significantly higher value to the fisherman. Currently under the proposed Amendment 10, a small vessel exception has been granted with the requirement for 100% observer coverage, allowing a vessel to sort whiting at-sea, and landing product shoreside. In the event that Amendment 10 is not in place prior to the beginning of the 2009 whiting fishery, ODFW recommends regulations established through the 2009-2010 Specifications process that require this observer coverage.

Limited Entry Fixed Gear

<u>RCA Boundaries</u>

Data has shown that yelloweye rockfish impacts in the limited entry fixed gear fishery are higher in the area between Cape Blanco and Cascade Head, therefore ODFW recommends moving the seaward non-trawl Rockfish Conservation Area (RCA) boundary from 100 to 125 fm in the area between Cape Blanco and Cascade Head except on days when the directed Pacific halibut fishery is open. When the directed Pacific halibut fishery is open, the seaward boundary would remain at 100 fm. The directed Pacific halibut fishery occurs approximately 3-6 days per year. Additionally, the majority of Pacific halibut is caught between 100 and 125 fm. This is a significant fishery for Oregon, therefore we feel strongly about allowing this opportunity to continue.

Commercial Nearshore Fisheries North of 40°10’ N. Latitude

RCA Boundaries

To reduce impacts to yelloweye rockfish in the commercial nearshore fishery, ODFW recommends setting a 20 fm shoreward non-trawl RCA boundary in the area between 40°10’ N lat. and Cape Blanco (43° N lat.) and retain the status quo shoreward boundary of 30 fm north of 43° N lat. Data provided by the West Coast Groundfish Observer Program shows higher yelloweye rockfish bycatch rates in the area between 40°10’ N lat. and Cape Blanco. Therefore, ODFW recommends taking action that affects that specific area. The area north of Cape Blanco has been shown to have very low rates of yelloweye rockfish intercepts.

ODFW RECOMMENDATIONS

Oregon Recreational Groundfish Fishery

1. **Adopt the status quo season structure as shown.**
2. **Adopt the bag limit and length limit components as shown.**
3. **Adopt the inseason management tools as shown.**

Limited Entry Whiting

1. **Modify the regulations governing the limited entry whiting fishery to accommodate a small vessel exception, allowing vessels 75 ft. in length or less to head, gut, and tail Pacific whiting at-sea.**
2. **Require 100% observation for vessels operating under the above small vessel exception.**

Limited Entry Fixed Gear

1. **Adopt a seaward boundary for the non-trawl RCA of 125 fm in the area between Cape Blanco and Cascade Head except on days when the directed halibut fishery is open, when the line would remain at 100 fm.**

Commercial Nearshore

1. **Adopt a shoreward boundary for the non-trawl RCA of 20 fm in the area between 40°10’ N lat. and Cape Blanco (43° N lat.).**
2. **Adopt a shoreward boundary for the non-trawl RCA of 30 fm north of 43° N lat.**

Quinault Indian Nation

POST OFFICE BOX 189 □ TAHOLAH, WASHINGTON 98587 □ TELEPHONE (360) 276-8211

June 12, 2008

Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Re: Quinault participation in whiting fishery

Dear Mr. Hansen,

The Quinault Indian Nation anticipates that it will begin to participate in the whiting fishery in 2010. We will keep the PFMC, NOAA-NMFS, and the other coastal tribes apprised of more definitive information regarding anticipated fleet structure and harvest levels as our plans develop. We request that the PFMC anticipate and provide for our entry into this fishery when it establishes the overall tribal catch allowance for whiting and incidental impacts on depleted rockfish species.

Discussions have been initiated with NOAA-NMFS and the four coastal tribes with usual and accustomed fishing areas off the coast of Washington to develop a management plan that ensures orderly conduct of the treaty whiting fishery. It is our intent to work in concert with the other tribes to craft a plan that ensures adequate monitoring, timely reporting, and minimization of impacts on depleted rockfish species while providing sufficient flexibility and guidance to enable each participating tribe to meet its management objectives and needs.

We are well aware of concerns regarding by-catch of depleted rockfish species during the whiting fishery. We have analyzed data from the NW Science Center to help us assess potential impacts of a future Quinault fishery on these species. When the Quinault Nation decides to participate in the whiting fishery, it will do so with a proven record of responsible and accountable fishery management as a self-regulatory tribe, a designation recognized by the federal court over three decades ago.

Sincerely,

Ed Johnstone

Ed Johnstone
Fisheries Policy Representative

cc: Donald McIssac, Pacific Fisheries Management Council
Frank Lockhart, NOAA Fisheries
Eileen Cooney, NOAA Fisheries

MAKAH TRIBE

P.O. BOX 115 • NEAH BAY, WA 98357 • 360-645-2201

The Makah Tribe is an equal opportunity employer.

June 2. 2008

Donald K. Hansen, Chairperson
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

D. Robert Lohn, Regional Administrator
National Marine Fisheries Service
7600 Sand Point Way NE
Seattle, WA 98115-0070

Dear Mr. Hansen and Mr. Lohn:

The purpose of this letter is to describe and explain the basis for the Makah Indian Tribe's proposals for Indian treaty allocations in the Pacific whiting fishery in 2009 and 2010. In accordance with 50 C.F.R. § 600.324(d), our attorneys wrote to Mr. Lohn on April 2, 2008, setting forth our requests for treaty allocations and regulations in the 2009 and 2010 groundfish fisheries. A copy of that letter is attached hereto. This letter supplements our attorneys' April 2 letter with respect to our proposal for the whiting fishery in light of discussions that have taken place since April 2nd.

For 2009, we propose that 17.5 percent of the U.S. optimum yield be allocated to meet the needs of and be managed by the Makah Tribe and that 3.0 percent of the OY be allocated to meet the needs of and be managed by the Quileute Tribe. This would yield a total treaty allocation of 20.5 percent of the OY, which we believe is within the total treaty entitlement. Our proposal for a 17.5 percent Makah allocation is based on our experience in the fishery over the past 12 years, and is more fully explained in our attorneys' April 2 letter and in the discussion below. Our proposal for a 3.0 percent Quileute allocation is based on Quileute's representations to the National Marine Fisheries Service and to us that it will have one boat participating in the fishery in 2009, with an anticipated catch of 4,000 to 8,000 metric tons, and that it will work with the Groundfish Management Team to make realistic estimates of the projected bycatch associated with this level of whiting harvest.

For 2010, we again propose that 17.5 percent of the U.S. optimum yield be allocated to meet the needs of and be managed by the Makah Tribe. However, we propose that the Council and the Secretary defer recommending or adopting a 2010 allocation for Quileute or Quinault pending completion of the 2009 fishery and receipt of further information from Quileute or Quinault that provides a realistic estimate of the needs of their respective fisheries in 2010.

We also propose that a rollover mechanism be established so that whiting not harvested in the treaty fisheries can be rolled over to the non-treaty fisheries and that a portion of the projected bycatch of other species in the treaty fisheries, as shown on the Council's bycatch scorecard, can be rolled over to non-treaty fisheries if it is not needed in the treaty fisheries.

The following background information provides the context for and explains the basis of our proposals.

The May 2 Meeting.

After the April 2008 Council meeting, the National Marine Fisheries Service scheduled a meeting of those tribes that had expressed interest in participating in the 2009 or 2010 whiting fishery for May 2, 2008. NMFS requested that each tribe provide a reasonable projection of its whiting harvest and the bycatch of rebuilding species associated with that harvest at the meeting. In particular, in an April 18, 2008, email, Frank Lockhart stated "we would like to discuss the specifics of the tribal proposals, including the amount of whiting you are seeking, the amount of effort you anticipate (including number of boats and size of boats), the timing of the proposed fishery, the anticipated bycatch, and the tribal management and monitoring scheme, in terms of both bycatch and whiting."

The May 2 meeting was attended by representatives of the Makah Indian Tribe[1], the Quinault Indian Nation, the Quileute Indian Tribe, and the National Marine Fisheries Service. The Coastal Program Coordinator for the Northwest Indian Fisheries Commission also attended the meeting.

In the following paragraphs, we discuss the information provided by each tribe at the May 2 meeting, and then describe a proposal presented by the Makah Tribe at the conclusion of that meeting.

Makah

Consistently with our attorneys' April 2 letter, we projected a Makah whiting harvest of 17.5 percent of the U.S. optimum yield in 2009 and 2010 and bycatch levels consistent with the scorecard values we have provided to the Council and NMFS in recent years. Our projections were based on our experience in the fishery since 1996, our present fleet size of five catcher boats, our existing arrangements with two processors to process the catch, and the management measures we have implemented over the past 12 years to harvest whiting and minimize bycatch. We have described the particulars of our fishery,

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[1] Two members of the Makah Tribal Council, including either the Chairman or Vice-Chairman, the Director of Makah Fisheries Management, and our Chief Biologist attended each of the meetings described in the text. To our knowledge, no member of the Quinault or Quileute Tribal Councils attended any of the meetings, although both tribes sent senior fisheries managers and Quileute sent representatives of its Fish Committee.

including the number and size of boats, the timing of the fishery, and our management and monitoring scheme, on many occasions to the Council and NMFS.

To date, no other tribe has participated in the whiting fishery. As a result, the other tribes were unable to provide the specific information requested by NMFS.

Quinault

The Quinault Indian Nation had written to Mr. Lohn on April 4, 2008, requesting "information regarding NOAA Fisheries' procedures, protocols, and timeframes for consideration of requests for tribal participation in the whiting fishery." The letter stated Quinault anticipated "that [its] entry into the whiting fishery may occur as early as 2009," but did not propose a particular allocation or regulation for the Quinault fishery or provide any information regarding its projected effort or harvest. At the May 2 meeting, a Quinault representative stated that Quinault did not intend to participate in the whiting fishery in 2009, but might do so beginning in 2010 or 2011. Quinault's representative did not indicate what level of effort or harvest Quinault anticipated for 2010 or 2011.

Quileute

The Quileute Indian Tribe had written to Mr. Lohn on January 10, 2008, stating that one or more of its members would participate in the whiting fishery commencing in 2009. Its letter stated Quileute was "not presently requesting an increase in the whiting allocation to all coastal tribes," but was "advising NMFS of its intent to participate in this fishery and requesting that NMFS take any action that may be necessary to implement the Tribe's right."

When we learned about this proposal, we had several significant concerns about it. First, since its inception in 1996, the treaty allocation in the whiting fishery has been based on requests from and has been designed to accommodate the needs of only one tribe – Makah. We attach a memorandum from our attorneys that sets forth the regulatory history and confirms that the treaty whiting allocations have been designed solely to meet the needs of the Makah Tribe. By proposing to enter the fishery without requesting an increase in the treaty allocation, Quileute was proposing an allocation that would *not* be adequate to meet the combined needs of *both* tribes. Thus, Quileute was proposing to enter the fishery in a manner that was directly adverse to the interests of the established Makah fishery.

Second, Quileute's proposal contained no provision for each tribe to manage its own share of the allocation, and thus raised the possibility of a race for fish between the tribes. Our ability to minimize bycatch in our fishery is dependent on careful time and area management of the fishery in cooperation with experienced fishermen and an experienced mothership. By creating the potential for a race for fish, Quileute's proposal threatened to jeopardize our successful bycatch management regime. As Frank Lockhart pointed out at the May 2 meeting, NMFS' statistics demonstrate that when conditions for a race for fish are created, such as when NMFS announces the closing date for the fishery, bycatch goes up. By jeopardizing bycatch management, particularly for rebuilding species, Quileute was proposing to enter the fishery in a manner that is contrary to the conservation goals embodied in the rebuilding plans and the Magnuson-Stevens Act, and that was potentially adverse to almost every participant in west coast groundfish fisheries.

Third, Quileute's proposal did not address projected bycatch levels in its own fishery or any management measures it planned to implement to minimize bycatch. At the April Council meeting, a Quileute representative indicated that it would pattern its bycatch management on the measures employed by the Makah Tribe. The difficulty with this approach is that the Makah management regime: (1) depends on managing for a fixed amount of whiting, not conducting a race for fish with another tribe; (2) is tailored to Makah's fishing area, and cannot simply be copied in another area in which the timing and distribution of whiting and bycatch species are different; and (3) is based on the personal experience gained by the Makah fleet and the mothership in the Makah fishing area over the past 12 years. Thus, Quileute's proposal indicated that it had little understanding of the challenges facing its fishery in terms or bycatch management or a sound plan for addressing them.

In light of these concerns, our April 2 proposal was for a treaty allocation of 17.5 percent of the U.S. optimum yield to meet the needs of the Makah fishery *plus* an additional amount to accommodate the Quileute fishery. In order to avoid a race for fish, and to enable Quileute to develop bycatch management measures for its fishery and to project realistic bycatch levels, we proposed that each tribe receive a separate allocation for its fishery.

During the course of the April Council meeting, Quileute provided a copy of an April 10, 2008, letter from its attorneys to Mr. Lohn. In their letter, Quileute's attorneys argued that the prior treaty allocations in the whiting fishery had been tribal allocations available to any tribe, and that the Secretary could not legally make separate allocations to each tribe. We asked our attorneys to respond to these arguments, and their response is set forth in the attached memorandum. They note, among other things, that these arguments are directly contrary to claims Quileute has made in court – where Quileute has previously asserted that the treaty allocations in the whiting fishery were available *only* to the Makah Tribe, and that the Secretary is legally *required* to make separate allocations to each tribe. Our attorneys also note that the Ninth Circuit Court of Appeals has held expressly that the prior treaty allocations in the whiting fishery were to the Makah Tribe only – not to Quileute, Hoh or Quinault. It should also be noted that Quileute's attorneys themselves stated that Quileute did not "object to increasing the total tribal allocation to account for its expected participation in this fishery starting in 2009," thus acknowledging, at least implicitly, that the current allocation does not account for Quileute's planned participation in the fishery.

At the May 2 meeting, a Quileute representative indicated that Quileute anticipated it would have a single catcher boat, of between 95 and 125 feet in length, participating in the 2009 fishery, and that it anticipated a whiting harvest of between 4,000 and 8,000 metric tons. Quileute also indicated that it would work with the Groundfish Management Team to project bycatch impacts associated with this level of harvest in its fishing area. Quileute's representative stated the tribe anticipated increased levels of effort and harvest in 2010, but did not specify what those levels would be.

The Makah Proposal.

On the basis of this information, at the conclusion of the May 2 meeting we proposed an overall treaty whiting allocation for 2009 of 17.5 percent of the U.S. optimum yield to accommodate the Makah fishery and an *additional* 4,000 to 8,000 metric tons to accommodate the Quileute fishery, with each tribe responsible for managing its fishery consistently with its projected whiting harvest and bycatch levels. We also proposed that a rollover mechanism be developed to release whiting that is not harvested in the treaty fisheries and any portion of the projected bycatch levels that is not needed in the treaty fisheries. We proposed to defer the overall treaty allocation for the 2010 fishery until Quinault and Quileute were able to provide realistic projections of effort, harvest and bycatch for 2010.

NMFS' representatives who attended the May 2 meeting indicated that they believed this proposal would be workable. However, neither Quinault nor Quileute agreed to the proposal on May 2.

The May 6 Meeting.

The tribes and the Coastal Program Coordinator for the Northwest Indian Fisheries Commission met again, this time without NMFS, on May 6, 2008. At this meeting a Quileute representative re-stated Quileute's (new) legal position that the Secretary cannot lawfully make separate allocations to each tribe, and stated it intended to fish under the "tribal" allocation of 17.5 percent of the U.S. optimum yield in 2009. Quileute's representative also stated that, because Pacific whiting migrate from south to north in the spring, Quileute would be able to harvest the fish before Makah, and Quileute intended to use this advantage to preempt the Makah fishery. These comments, of course, increased our concern that Quileute's approach would lead to a race for fish, with adverse consequences for both tribes' fisheries, for efforts to minimize bycatch, and potentially for nearly every participant in west coast groundfish fisheries. This is particularly true because bycatch rates are higher in the early months of the season – that is, precisely when Quileute apparently intends to concentrate its harvest so as to preempt the Makah fishery.

However, later in the meeting, Quileute's representatives appeared willing to consider a management agreement in which each tribe would separately manage a portion of the overall quota that was sufficient to meet the needs of its fishery. Given the current U.S. optimum yield, and the likelihood of a similar level in 2009, it appeared that an overall 2009 allocation of 20.5 percent of the OY, with 17.5 percent to be managed by Makah and 3 percent (about 8,000 metric tons) to be managed by Quileute would be adequate to meet each tribe's needs.

Near the end of the meeting, a Quinault representative stated that Quinault might participate in the 2009 fishery after all, with as many as three to five boats, and that he would need to confer with the Quinault Tribal Council before supporting any kind of inter-tribal management agreement. Nevertheless, the Makah and Quileute representatives agreed to have the Northwest Indian Fisheries Commission's Coastal Program Coordinator prepare a draft Inter-Tribal Whiting Management Agreement for 2009, which was to provide for harvest guidelines for each tribe (Makah, Quileute and Quinault) and an overall tribal allocation. The harvest guidelines, which would guide each tribe's management of its own fishery, would not be designated as "allocations" and would not set a precedent for future years. Although the tribes contemplated a Makah harvest guideline of 17.5 percent of the OY and a Quileute harvest guideline of 3.0 percent of the OY, all of the amounts would be left blank in the draft agreement pending further information from Quinault. The meeting was adjourned to give Quinault time to consider whether it would participate in the 2009 fishery and, if so, what level of effort and harvest would be involved.

Following the May 6 meeting, NMFS informed us that it had received an email from Quinault stating Quinault had decided to participate in the whiting fishery in 2009, but that the email did not provide any information on the level of effort or harvest Quinault anticipated. As jointly requested by Makah and Quileute, the Northwest Indian Fisheries Commission's Coastal Program Coordinator circulated a draft management plan among the tribes, which provided for an overall treaty allocation and separate harvest guidelines for each tribe. Quinault's representative responded by email that the plan was unacceptable because Quinault would not agree to "separate allocations." The Coastal Program Coordinator informed us that Quileute objected to the first draft for the same reason.

The May 15 Meeting.

At the conclusion of the May 6 meeting, the tribes had agreed to meet again on May 15. Makah and Quiluete representatives, along with the Coastal Program Coordinator, attended the meeting. Quileute's representative and the Coastal Program Coordinator informed us that they had been contacted by Quinault's representative, who said that Quinault had decided *not* to participate in the whiting fishery in 2009 and therefore would not be attending the May 15 meeting. As it was relayed to us, the Quinault representative also stated that Quinault would have *five* or *six* catcher boats in the 2010 fishery and anticipated a harvest of about 7,000 metric tons per boat.

Quileute's representative indicated that Quileute still anticipated it would have a single catcher boat that would participate in the 2009 fishery, and that it anticipated a harvest of 4,000 to 8,000 metric tons. On this basis, Makah again proposed an overall treaty allocation of 20.5 percent of the U.S. optimum yield in 2009, with 17.5 percent of the OY to be managed by Makah and 3.0 percent of the OY (about 8,000 metric tons) to be managed by Quileute.

In response, Quileute's representative provided copies of a second draft Inter-Tribal Whiting Management Agreement for 2009, which had been prepared by the Northwest Indian Fisheries Commission's Coastal Program Coordinator after Quinault's and Quileute's objections to the inclusion of "separate allocations." This draft deleted the provision for individual harvest guidelines for each tribe that had been included in the first draft. Quileute's representative stated that Quileute would not agree to the inclusion of such harvest guidelines or any other language that referenced individual tribal allocations. Instead, Quileute would agree only to manage its fishery for the *overall* tribal allocation.

Quileute's representative also stated that an *overall* tribal allocation of 17.5 percent would be adequate to meet its needs in 2009 and 2010. Although Quileute's representative stated that Quileute would have *five* catcher boats participating in the 2010 fishery, with an anticipated harvest of *35,000* metric tons of whiting, he stated that an overall allocation of 17.5 percent of the OY in 2010 would be adequate for the Quileute Tribe because Quileute could harvest the fish before they reached the Makah fishing area and thereby preempt the Makah fishery. Quileute's representative stated that if Makah believed a larger allocation was needed to accommodate the Makah fishery, it would be up to Makah to obtain it.

We responded by again explaining that we could not support a management plan that would create the conditions for a race for fish, and that an overall allocation of 20.5 percent of the OY, with 17.5 percent to be managed by Makah and 3.0 percent to be managed by Quileute, was needed to meet the needs of both tribes in 2009. When Quileute continued to reject any separate harvest guidelines or allocations for the tribal fisheries, we suggested that the tribes agree that we would each propose an overall treaty allocation of 20.5 percent for the 2009 fishery, with the understanding that we would each submit our own testimony in support of the proposal in light of our differences with respect to the need for separate harvest guidelines. This suggestion was for the 2009 fishery only, and Quileute agreed to it.

Makah's Proposal for 2009.

On the basis of the discussions summarized above, and as set forth at the beginning of this letter, we propose a 2009 allocation of 17.5 percent of the U.S. optimum yield to meet the needs of and be managed by the Makah Tribe and 3.0 percent of the OY to meet the needs of and be managed by the Quileute Tribe, for a total 2009 treaty whiting allocation of 20.5 percent of the OY. We also propose that a rollover mechanism be established so that whiting not harvested in the treaty fisheries can be rolled over to the non-treaty fisheries and that a portion of the projected bycatch of other species, as shown on the Council's bycatch scorecard, can be rolled over to non-treaty fisheries if it is not needed in the treaty fisheries.

As explained above, our proposal for the Makah allocation is based on the demonstrated needs and harvesting capacity of the Makah fishery, while our proposal for the Quileute allocation is based on Quileute's representations to NMFS and to us that it will have one boat participating in the fishery in 2009, anticipates a harvest of 4,000 to 8,000 metric tons, and will work with the Groundfish Management Team to develop realistic estimates of bycatch associated with this level of whiting harvest. We are also relying on the most recent information we have from Quinault, which is that it does not intend to participate in the fishery in 2009. On these bases, we believe our proposal will meet the needs of the two tribes (Makah and Quileute) that intend to participate in the 2009 whiting fishery, as determined by the tribes themselves. No tribe can object to an allocation that is large enough to meet its anticipated needs.

Moreover, we believe an overall treaty allocation of 20.5 percent is within the total treaty entitlement. The Ninth Circuit has held that where the tribes themselves request less than the full treaty entitlement, it is appropriate for the Secretary to allocate the requested amount to the tribes. *See Midwater Trawlers Co-operative v. Department of Commerce,* 393 F.3d 994, 1004 (9th Cir. 2004).

Assuming Quileute, working with the Groundfish Management Team, is able to project bycatch levels associated with its anticipated whiting harvest, we are hopeful that the bycatch levels associated with each tribe's harvest will be consistent with current rebuilding plans and will not trigger formal treaty – non-treaty allocations of bycatch species. As NMFS and the Council know, we have successfully managed bycatch in our fishery in order to meet these goals.

Finally, we continue to believe it is imperative that the Council recommend, and that Secretary provide, that the overall treaty allocation will be separately managed by each tribe so as not to exceed its projected harvest levels for whiting and its projected bycatch levels. As discussed above, without such a provision, an overall allocation will create the potential for a race for fish between the tribes, which will result in increased bycatch and jeopardize the rebuilding plans for key species. Moreover, a provision for separate management will facilitate the sovereign management authority of each tribe, allowing each tribe to structure its own fishery in a manner that maximizes its opportunity to harvest whiting, minimizes bycatch, and meets the needs of its fishermen and the processors who are engaged to process the catch.

As set forth in the Pacific Groundfish Fishery Trawl Rationalization EIS (at 4), the Council's goal for the capacity rationalization plan in the trawl sector is to "increase[] net economic benefits, create[] individual economic stability, provide[] for full utilization of the trawl sector allocation, consider[] environmental impacts, and achieve[] individual accountability of catch and bycatch." Quileute's proposal for the treaty allocation in the whiting fishery, which would create a race for fish in which a new entrant to the fishery deliberately seeks to preempt the established fishery of a long-term participant, runs directly counter to every element of the Council's goal. In contrast, Makah has long managed its fishery with these objectives in mind, and our proposal to allow each tribe to manage a portion of the overall treaty allocation will promote these objectives as new tribal participants enter the treaty fishery.

Finally, as discussed in the accompanying memorandum from our attorneys, a provision for each tribe to manage its own portion of the overall allocation is well within the Secretary's legal authority. This is particularly true where, as here, such a provision is necessary for conservation of depleted species and to prevent one tribe from attempting to preempt the established fishery of another tribe. Under current circumstances, such a provision would not put the Secretary in the position of making an inter-tribal allocation decision, since the needs of each tribe's fishery have been determined by each tribe itself.

Makah Proposal for 2010.

As also set forth above, we propose that 17.5 percent of the U.S. optimum yield be allocated to meet the needs of and be managed by the Makah Tribe in 2010, again based on the demonstrated needs and capacity of the Makah fishery. However, we propose that the Council and the Secretary defer recommending or adopting a 2010 allocation for Quileute or Quinault pending completion of the 2009 fishery and receipt of further information from Quileute or Quinault that provides a realistic estimate of the needs of their respective fisheries in 2010.

To date, we have received no information from Quileute or Quinault regarding the bases for their projected effort or harvest levels in the 2010 fishery. They are proposing, in the first or second year of their participation in the whiting fishery, to achieve effort and harvest levels that we did not achieve for many years in our fishery under more favorable conditions in terms of competition and bycatch constraints. Neither tribe has identified the number of tribal fishermen who have expressed interest in participating in the fishery, the number of such fishermen who have the ability to acquire catcher boats to do so, the number of tribal members available to crew the boats, the boats that will be acquired, the processing capacity available to the tribes, or other pertinent information. Similarly, we have received no information from Quileute or Quinault regarding bycatch levels associated with their projected 2010 whiting harvests, or management measures they will employ to minimize bycatch.

Under these circumstances, we continue to believe it is premature to consider an overall treaty allocation for 2010. When combined with the established Makah fishery, the preliminary 2010 effort and harvest levels currently proposed by Quileute and Quinault would likely trigger the need: (1) to quantify the total treaty entitlement to Pacific whiting and bycatch species; (2) to determine an inter-tribal allocation of Pacific whiting and bycatch species; and (3) to adjudicate the western boundary of the Quileute and Quinault usual and accustomed grounds for purposes of both the total treaty entitlement determination and the inter-tribal allocation. There is no need to trigger these difficult determinations pending more realistic effort and harvest projections from Quileute and Quinault.

Thank you for your consideration. We will be prepared to answer any questions you may have at the June 2008 Council meeting.

Sincerely,

Russ Svec, Director
Makah Fisheries Management

Steve Joner, Chief Biologist
Makah Fisheries Management

cc: Members of the Pacific Fishery Management Council
Frank Lockhart
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April 2, 2008

D. Robert Lohn
Regional Administrator
National Marine Fisheries Service
7600 Sand Point Way NE
Seattle, WA 98115-0070

Re: Treaty Indian Groundfish Fisheries in 2009 and 2010

Dear Mr. Lohn:

We have been asked to write to you on behalf of the Makah Indian Tribe. Pursuant to 50 C.F.R. § 660.324(d), the Tribe requests that provision be made for harvest of groundfish by Pacific coast treaty Indian tribes in 2009 and 2010 by continuing, with the exceptions noted below, the treaty regulations and allocations in effect in 2007 and 2008.

The exceptions are as follows. First, as in 2007 and 2008, the Tribe proposes that Tribal fisheries be subject to the Limited Entry trip limits in place at the beginning of each year for both shortspine and longspine thornyheads. However, the Tribe proposes that it be able to combine those trip limits for all periods and all midwater trawl vessels in the Makah fleet, and utilize the total amount in a way that minimizes bycatch of other species.

Second, the Tribe requests that its allocation in the Pacific whiting fishery be equal to 17.5 percent of the Optimum Yield for whiting, instead of using the sliding scale allocation table that has been in use since 1999. Moreover, if the Quileute Tribe intends to participate in the Pacific whiting fishery, an additional allocation should be provided for the Quileute Tribe and appropriate measures should be developed to address observer coverage for and bycatch in the Quileute fishery.

The Tribe's proposals for the Pacific whiting fishery are based on the following considerations. The sliding scale allocation table was first presented to the Pacific Fishery

Management Council in September 1998 as a three-year proposal. At that time, Quileute had expressed interest in participating in the fishery. Accordingly, the sliding scale allocation table explicitly provided for separate Makah and Quileute allocations, as follows:

U.S. Harvest Guideline	Makah Allocation	Quileute Allocation
Up to 145,000 mt	17.5% of U.S. Harv. Guide.	2,500 mt
145,001 to 175,000 mt	25,000 mt	2,500 mt
175,001 to 200,000 mt	27,500 mt	2,500 mt
200,001 to 225,000 mt	30,000 mt	2,500 mt
225,002 to 250,000 mt	32,500 mt	2,500 mt
Over 250,000 mt	35,000 mt	2,500 mt

At the March 1999 Council meeting, Quileute announced that it would not be participating in the whiting fishery in 1999. Accordingly, NMFS used the sliding scale allocation table to make an allocation of 32,500 mt to Makah, based on an OY of 232,000 mt. *See* 64 Fed. Reg. 27,928, 27,929 (May 24, 1999).

Although the allocation was a "tribal" allocation, all parties understood that it had been requested by and was designed to meet the needs of the Makah Tribe alone. This was confirmed by the Ninth Circuit Court of Appeals when Midwater Trawlers Cooperative challenged the 1999 allocation. Among other things, Midwater argued that the allocation was based on an overly expansive definition of the coastal tribes' usual and accustomed grounds. The Court held Midwater lacked standing to challenge the usual and accustomed grounds of Hoh, Quileute or Quinault because "*NMFS has not allocated any Pacific whiting to them.*" *Midwater Trawlers Co-op v. Department of Commerce,* 282 F.3d 710, 716 (9th Cir. 2002) (emphasis added). Rather, "the only tribal allocation properly at issue is that to the Makah Tribe." *Id.*

Quileute has not requested an allocation in any other year, until now. In each year, Makah was the only Tribe requesting an allocation in the whiting fishery and the "tribal" allocation was based on the sliding scale allocation table to meet the needs of the Makah fishery.

Since the Makah Tribe proposed the sliding scale allocation table ten years ago, its fishery has developed and matured. Today, the Makah whiting fleet comprises five vessels that consistently participate in the fishery and fully harvest the Makah allocation. The Tribe has contractual arrangements with both an at-sea and a shore-based processor to harvest the catch. It has observer coverage on-board the at-sea processor and at the shore-based facility. It has a full retention policy for all bycatch and intensively manages the fishery to minimize bycatch of depleted groundfish species and chinook salmon.

Given the development of its fishery, the Tribe believes an allocation of 17.5 percent of the OY would better meet its needs while still remaining well within the scope of its treaty right. A straight 17.5 percent allocation would avoid sudden changes in the Tribe's allocation as a result of small changes in the OY. Also, the Tribe's understanding of the fishery, as a result of twelve years of experience, means that it can fully harvest a 17.5 percent allocation at higher OY levels with its existing fleet, while still minimizing bycatch.

In upholding the sliding scale allocation table, the Ninth Circuit began with the proposition that the Tribe "is entitled to one half of the Pacific whiting passing through its usual and accustomed fishing grounds." *Midwater Trawlers v. Department of Commerce*, 393 F.3d 994, 1003 (9th Cir. 2004). It then noted that NMFS' data suggest that Pacific whiting's migration pattern takes the bulk of the stock through the Makah Tribe's usual and accustomed fishing grounds. *Id.* This is significant because it means that all migrating coastal Pacific whiting are potentially exploitable by Makah. *Id.* at 1004. Accordingly, basing the Makah allocation on a percentage of the OY was consistent with the best available science and treaty allocation principles. *Id.* at 1004-05.

Under the sliding scale allocation table, "the Makah Tribe would be allocated a percentage ranging from 14 [to] 17.5 percent" of the OY. *Id.* at 1004. Midwater argued that NMFS failed to explain the scientific basis for this range. *Id.* at 1004 n.11. In rejecting this argument, the Ninth Circuit made it clear that a 17.5 percent allocation is well within the scope of the Makah's treaty right:

> Contrary to Midwater's argument, [the] Fisheries Service is not required to establish that these percentages are supported by the best scientific information available. We have previously concluded that Makah's treaty rights entitle it to *50 percent* "of the harvestable surplus of Pacific whiting that passes through its usual and accustomed fishing grounds, or that much of the harvestable surplus as is necessary for tribal subsistence." *Midwater II*, 282 F.3d at 719. Nothing, however, supports the notion that a tribe is obligated to take its full 50 percent entitlement. That the tribe opts to not take its full treaty share does not put [the] Fisheries Service in the position of justifying a tribe's lower allocation request. Rather, [the] Fisheries Service is required only to support its decision to use the U.S. Optimum Yield as the basis from which to measure the tribe's allocation. And, we conclude that [the] Fisheries Service has met this obligation.

Id. (italics in original; underlining added).

Accordingly, Makah's current proposal for an allocation of 17.5 percent of the OY will remain well within the scope of its treaty right and, indeed, will remain less than "its full treaty share."

In order to avoid potentially significant disruption to the Makah fishery, Quileute's participation should be based on a separate allocation as contemplated when the sliding scale allocation table was first proposed in 1998. Quileute has not contacted the Makah Tribe to notify it of Quileute's plans to participate in the fishery, and has not provided any information to Makah regarding the number of Quileute vessels that will participate, the anticipated harvest of whiting, or the projected bycatch of other species. The Makah Tribe, its fishermen, their crews, and the processors have all made significant investments to establish and develop the Makah whiting fishery, and have foregone opportunities to participate in other fisheries. Makah's allocation requests have been designed to meet the needs of its fishery and to remain well within the scope of its treaty right. If Quileute wants to participate in the fishery, an additional allocation should be made to accommodate its fishermen, rather than simply diverting an unknown portion of the Makah allocation to them.

The need for a separate, additional allocation to Quileute is particularly acute given bycatch concerns, especially for widow and canary rockfish. The Makah Tribe intensively manages its fishery to reduce impacts on these species and to accommodate the needs of non-treaty fisheries within the constraints of current rebuilding plans. Quileute has provided no information concerning projected impacts on these or other species in its fisheries, its plans for observer coverage, or on management efforts it intends to implement to reduce bycatch.

Under these circumstances, if Quileute intends to participate in the whiting fishery in 2009 or 2010, the "tribal" allocation should include an additional allocation, over and above the 17.5 percent allocation to Makah, to accommodate the Quileute fishery, and appropriate measures should be developed to address observer coverage for and bycatch in the Quileute fishery. The Makah Tribe intends to contact the Quileute Tribe to discuss these matters and to attempt to coordinate the Tribes' respective fisheries.

Makah representatives will be available to discuss any questions you or your staff may have regarding these matters at the upcoming Council meeting.

Very truly yours,

ZIONTZ, CHESTNUT, VARNELL,
BERLEY & SLONIM

Marc D. Slonim

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MEMORANDUM

TO: Russ Svec and Steve Joner
Makah Fisheries Management

FROM: Marc Slonim
Ziontz, Chestnut, Varnell, Berley & Slonim

DATE: June 2, 2008

RE: Indian Treaty Allocations in the Pacific Whiting Fishery

You have asked us to review and comment on an April 10, 2008, letter from attorneys for the Quileute Indian Tribe to Robert Lohn, Regional Administrator of the National Marine Fisheries Service. In their letter, Quileute's attorneys object to the Makah Tribe's April 2, 2008, proposal that the Secretary of Commerce allocate 17.5 percent of the U.S. optimum yield in the 2009 Pacific whiting fishery to the Makah Tribe and make a separate, additional Indian treaty allocation to meet the needs of the Quileute Tribe. Quileute's attorneys do not explain how the Quileute Tribe would be harmed by a separate allocation that is adequate to meet its needs, but argue on purely legal grounds that it would be unlawful for the Secretary to make separate allocations to each of the tribes.

In particular, Quileute's attorneys assert that "[t]here is no basis to and it would be entirely inappropriate for NMFS to allocate any fishery, including Pacific whiting, on a tribe-by-tribe basis." This is a curious argument for the Quileute Tribe to make. In 1997, the Quileute Tribe sued the Secretary of Commerce challenging the Secretary's allocations in the black cod fishery. In that lawsuit the Quileute Tribe argued that the Secretary acted *unlawfully* in making a single, overall allocation to all four coastal tribes, and that the Secretary was *legally required* to make separate allocations to each tribe. *See* Petition for Judicial Review of Final Agency Action at 6-8, filed Feb. 4, 1997, in *Quileute Indian Tribe v. Daley*, No. C97-5071 (W.D. Wash.). Quileute's attorneys make no attempt to reconcile their current position with the opposite position Quileute took in court in 1997.[1]

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[1] The Court did not reject Quileute's position. The case was dismissed for failure to join indispensable parties. *See* Order Granting Federal Respondent's Motion to Dismiss and Denying Petitioner's Motion for Consolidation (filed May 21, 1997).

In support of their current position, Quileute's attorneys first assert that "[t]ribal allocations of all federally-managed fisheries, including Pacific whiting, have always been made to all affected tribes, leaving it up [to] the tribes to decide the appropriate intertribal distribution." Similarly, they assert that, "[c]ontrary to Makah's claim, NMFS made abundantly clear during the 1999 regulatory process that its allocation was for all four coastal tribes."

These assertions are erroneous. We append to this memorandum a summary of the Indian treaty allocations in the Pacific whiting fishery. That summary shows that, with a limited exception in 2000, the Indian treaty allocations in the Pacific whiting fishery always have been made to a single tribe – the Makah Tribe – not to all of the coastal tribes. Indeed, in 1997, Quileute *objected* when it interpreted a Federal Register notice to provide for a whiting allocation to *all* of the coastal tribes, and only withdrew its objection after NMFS stated in court filings that the allocation was *only* for the Makah Tribe. In 2001, Quileute submitted a brief in the Ninth Circuit Court of Appeals in which it argued that it had *never* received an allocation in the whiting fishery – and the Court agreed. Here too Quileute's attorneys make no attempt to reconcile their current position with the opposite position Quileute previously took in court.

Moreover, in addition to the Makah-only whiting allocations, a special Federal regulation for Indian treaty midwater trawl fisheries has, since its adoption in 1996, been limited explicitly to the Makah Tribe. *See* 50 C.F.R. § 600.324(k).

Furthermore, there are several circumstances pertaining to the 2009 Pacific whiting fishery that have not been present previously. These new circumstances provide the basis for separate allocations to the tribes in 2009, whether or not the Secretary has previously made such separate allocations.

First, with limited exceptions in 1999 and 2000, no tribe other than Makah has sought to participate in the Pacific whiting fishery. In 1999 and 2000, the other tribes seeking to participate in the fishery (Quileute in 1999 and Hoh in 2000) sought small allocations and agreed to manage their fisheries within those allocations. In contrast, for 2009 (and beyond), Quileute insists it is entitled to harvest the entire treaty allocation, and is unwilling to agree to manage its fishery for a portion of the overall treaty allocation that would meet the needs of its fishery. Indeed, you have informed us that a Quileute representative has stated openly and repeatedly that Quileute intends to use its perceived geographic advantage to preempt the Makah fishery. These positions create, for the first time, circumstances that could give rise to a race for the fish in the treaty whiting fishery, with adverse consequences for both tribes' fisheries and for bycatch management.

Second, some of the species taken as bycatch in the Pacific whiting fishery have been declared overfished and are now subject to mandatory rebuilding plans that constrain all west coast groundfish fisheries. Thus, by creating the conditions of a race for fish, Quileute's proposed entry into the fishery in 2009 presents serious conservation concerns, with potential adverse consequences for the affected species and for all participants in west coast groundfish fisheries.

Under these circumstances, the Secretary has authority to make separate allocations to each tribe so as to prevent a race for fish, conserve depleted species taken as bycatch, and prevent preemption of the Makah fishery. The Secretary's Magnuson-Stevens Act authority to take regulatory action to prevent a race for fish under very similar circumstances was upheld recently in *Starbound, LLC v. Guitierrez*, 2008 WL 1752219 (W.D. Wash. Apr. 15, 2008). In that case the plaintiff had acquired limited entry permits to participate in the catcher/processor sector of the 2007 Pacific whiting fishery. However, just before the fishery opened, the Secretary promulgated an emergency regulation barring participation by any vessel without a history of sector-specific participation in the fishery. This had the effect of barring the plaintiff from the 2007 fishery. *See id.* at *1.

The Court explained that, in order to carry out the purposes of the Magnuson-Stevens Act, which include rebuilding overfished stocks, the Council conducts an annual stock assessment, which is used to determine an optimum yield, which is then allocated to the three different sectors within the non-treaty fishery (after subtracting the treaty allocation). "The rationale for allocating portions of the optimum yield to these three sectors is to reduce the incentive for a 'derby-style race for fish' that might upset the desired balance of fish species." *Id.* The emergency rule adopted by the Secretary had been recommended by the Council "based on a belief that certain recent developments could lead to a 'race for fish'" in the 2007 season. *Id.* at *2.

The plaintiff argued that, because there was much greater potential for excessive bycatch levels in the shoreside sector, it was arbitrary to limit its entry into the catcher/processor sector. The Court rejected this argument for two reasons. First, even if bycatch rates are "much higher" in the shoreside sector, it was undisputed that catcher/processors contribute to the problem to some degree. *Id.* at *5. Second, "because bycatch rates are higher in the early months of the season, intensive fishing at those times presents of heightened risk of a 'disaster tow' and early closure of the Fishery." *Id.* at *6.

The plaintiff also argued that it was willing to join the Pacific Whiting Conservation Cooperative in order to avoid a race for fish, and that opposition to its entry into the PWCC proved that "'[t]his is an allocation issue, not a conservation, safety, or economic disaster issue.'" *Id.* The Court rejected this argument as well. It reasoned that, while "this appears to be *both* an allocation issue and a conservation issue," it was primarily a conservation issue for the Secretary:

> The parties agree that cooperation and communication in the catcher/processor sector by members of the PWCC has contributed greatly to the stability of the Fishery. This system, however, is a voluntary one, the absence of which produces the paradigmatic "tragedy of the commons," in which individual fishing interests have an incentive to aggressively fish early in the season, when bycatch levels are high, in

> order to ensure their own yield. If all participants behave this way, as they are pressured to once the cooperative structure breaks down, they reach bycatch limits early and the whole Fishery closes prematurely. This was clearly a main concern upon which the Council relied in making its recommendation, . . . and whatever motives Plaintiffs would ascribe to the PWCC, it is fundamentally about conservation from Defendants' standpoint.

Id.

There are even greater concerns about a potential race for fish in our situation. You have informed us that Quileute's representative has stated openly and repeatedly that Quileute intends to exploit its geographic advantage to preempt the Makah fishery. Thus, unlike the *Starbound* plaintiff, Quileute is not seeking to avoid a race for the fish, but is openly promising to engage in a race for the fish, which will concentrate harvests early in the season, disrupt cooperative fishing patterns in the established Makah fishery, and increase bycatch of depleted species. Under these circumstances, the *Starbound* decision makes it clear that the Secretary has authority under the Magnuson-Stevens Act to take regulatory action to prevent a race for the fish, regardless of incidental allocative effects.

Moreover, in our situation, the Makah Tribe is not proposing to prohibit the Quileute Tribe from entering the fishery. Rather, it is proposing only that the Secretary make a separate allocation to the Quileute Tribe, *based on the Quileute Tribe's own projected 2009 harvest*. Thus, the Secretary would not be in the position of making an inter-tribal allocation decision, but would simply be allocating to each tribe an amount of whiting that each tribe has said it expects to harvest. In the absence of an agreed tribal management plan, and in the face of Quileute's explicit threats to preempt the Makah fishery, such an allocation is a reasonable and necessary conservation measure. The Secretary's authority to adopt such measures for the treaty fishery is well established. *See, e.g., Washington v. Washington Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 682 (1979); *Makah Indian Tribe v. Brown*, No. C85-1606R, Order on Five Motions Relating to Treaty Halibut Fishing at 6-7 (W.D. Wash. Dec. 29, 1993); *see also United States v. Washington*, No. 9213, Subproceeding 96-1, Order Re: Granting Preliminary Injunction at 5 (W.D. Wash. Mar. 22, 1996) (enjoining Quileute Tribe from unrestricted use of pot gear in black cod fishery because of impacts on established fisheries of other tribes).

Quileute's attorneys also argue that a provision in the Framework Regulation NMFS adopted in 1996 to implement Indian treaty fishing rights in the groundfish fishery makes "it clear that NMFS must make groundfish allocations to 'the tribes' as a whole, not separate allocations to individual tribes as Makah requests." In particular, Quileute's attorneys cite the provision in 50 C.F.R. § 660.324(d) which states that such rights "will be implemented either through an allocation of fish that will be managed by the tribes, or through regulations in this section that will apply specifically to the tribal fisheries." According to Quileute's attorneys, "[c]onsistent with this regulatory authority, NMFS has always designated its Pacific whiting allocation in the federal regulations as a 'tribal allocation.' *See, e.g.*, 50 C.F.R. § 660.385(e)."

There is nothing in the language of the regulation that precludes Makah's request for separate allocations to be managed by each tribe – as Quileute insisted was *legally required* in its 1997 lawsuit. An allocation of fish that contains a component to be managed by the Makah Tribe and a component to be managed by the Quileute Tribe is still "an allocation of fish that will be managed by the tribes." And, a directive to each tribe to manage for a particular portion of the allocation is a "regulation[] . . . that . . . appl[ies] specifically to the tribal fisheries." Under the circumstances present here, such an approach is reasonable and necessary for conservation, and there is nothing in § 660.324 that disclaims the Secretary's authority to adopt reasonable and necessary conservation measures.

Moreover, as indicated above, in every year except 2000, NMFS has made it clear that its "tribal allocations" in the Pacific whiting fishery have been for the Makah Tribe only. The Quileute Tribe objected to the 1997 allocation until NMFS clarified that it was *only* for the Makah Tribe, and Quileute insisted in 2001 that it had *never* received an allocation in the whiting fishery. Moreover, the midwater trawl regulation currently codified at 50 C.F.R. § 660.324(k) has, since its adoption in 1996, been limited explicitly to the Makah Tribe. Thus, from the beginning, NMFS has interpreted the framework regulation as authorizing it to make allocations to or regulations for individual tribes, and Quileute has both recognized this and insisted that NMFS do so.

Quileute's attorneys also point to two statements relating to the 1999 allocation in support of their position. First, they note that in response to a joint Makah-Quileute proposal for separate allocations in 1999, NMFS stated that it "believe[d] that the intertribal distribution of the overall tribal allocation is an internal tribal issue, and herein issues only a total allocation for the affected tribes." 64 Fed. Reg. 27,929 (May 24, 1999). However, as noted above, in making a joint proposal for the 1999 fishery, Makah and Quileute had reached agreement on separate allocations and neither tribe was threatening to preempt the other tribe's fishery. The situation today is very different. As discussed above, Quileute has refused to enter into an agreement providing for separate tribal harvest guidelines or allocations, and it is openly threatening to preempt the Makah fishery. This creates the potential for a race for fish, which adverse consequences to each tribe's fishery and to conservation of species taken as bycatch. These conservation concerns are especially acute given the declarations of overfished species and the adoption of rebuilding plans since 1999. In analogous circumstances, the *Starbound* court held that the Secretary could take action to prevent a race for fish notwithstanding that such action presented both a conservation and an allocation issue.

Second, Quileute's attorneys quote the first sentence in a Ninth Circuit opinion in which the Court stated it was considering "a challenge by fishing industry groups and the States of Oregon and Washington to a federal regulation that increased the amount of Pacific whiting fish allocated to *four Indian tribes*." *Midwater Trawlers Co-operative v. Department of Commerce*, 282 F.3d 710, 714 (9th Cir. 2002) (emphasis added).

However, later in its opinion the Court noted more precisely that, "[i]n 1999, Midwater and Oregon challenged in Oregon federal district court another NMFS regulation, which increased the 1999 amount of Pacific whiting allocated *to the Makah Tribe* to 32,5000 metric tons." *Id.* at 716 (emphasis added). Before reaching the merits, the Court considered whether Midwater Trawlers had standing to challenge the definition of the Quileute, Hoh and Quinault usual and accustomed fishing areas in the Framework Regulation. It held Midwater Trawlers did not have standing to do so because "NMFS has not allocated any Pacific whiting to them"; according to the Court, the "only tribal allocation properly at issue is that to the Makah Tribe." *Id.* When it reached the merits, the Court made it clear that it was addressing only the rights of the Makah Tribe under the Makah treaty (the Treaty of Neah Bay), not the rights of the Quileute, Hoh or Quinault Tribes under their treaty (the Treaty of Olympia), because the challenged allocation was only to the Makah Tribe. *Id.* at 718 – 721. Thus, any ambiguity created by the Court's opening statement is resolved by the Court's *holding* with respect to Midwater Trawlers' standing to challenge the description of Quileute, Hoh and Quinault's usual and accustomed grounds, and by its discussion of the merits of the 1999 allocation.

Quileute's attorneys claim that "[p]assing references to the 'Makah allocation' and the like simply reflect the fact that Makah has been the only participant in the fishery to date." It is true that the Makah Tribe has been the only tribe to participate in the treaty whiting fishery to date. However, the many references to the "'Makah allocation' and the like" are not simply "passing references" but accurate descriptions of the allocations that have been made in the fishery. Under the Framework Regulation, a tribe seeking to participate in the fishery must make a request for an allocation or regulation from NMFS and, with the very limited exceptions discussed in this memorandum, Makah has been the only tribe to do so. Accordingly, NMFS has consistently limited the treaty allocations in the whiting fishery to the Makah Tribe.

Finally, it is important to note that, contrary to the suggestion in the Quileute attorneys' letter, the Makah Tribe does not claim that it has "a perpetual and exclusive right to the entire tribal allocation." Makah has never opposed Quileute's (or any other tribe's) entry into the fishery, and has affirmatively proposed an increase in the total allocation to accommodate Quileute's stated intent to participate in the fishery, both in 1999 and again for 2009. Makah also supported an allocation that included the Hoh Tribe in 2000, and has made it clear in other years that the overall allocation should accommodate the needs of all tribes that seek to participate in the fishery.

The issue that divides Makah and Quileute today is not whether Quileute is entitled to enter the fishery but how to structure its entry into the fishery. Quileute insists that there be a single overall allocation with no separate harvest guidelines or allocations to manage each tribe's fishery, and has threatened to preempt the established Makah fishery in a race for fish. In the face of Quileute's adamant refusal to enter into any agreement that specifies a harvest guideline for its fishery, the issue for the Council and the Secretary is whether they must stand by while Quileute creates a race for fish, undermines conservation values embodied in rebuilding plans for depleted species, and threatens to preempt an established tribal fishery. For the reasons discussed above, we believe the Council and the Secretary have ample legal authority to make separate allocations to the tribes to prevent this.

Summary of Indian Treaty Allocations in the Pacific Whiting Fishery

The 1996 Allocation.

The Secretary of Commerce first made an Indian treaty allocation in the Pacific whiting fishery in 1996. The National Marine Fisheries Service announced the adoption of a Framework Regulation to implement Indian treaty rights in west coast groundfish fisheries and the Makah whiting allocation in a June 6, 1996, Federal Register notice. *See* 61 Fed. Reg. 28,786 (June 6, 1996). NMFS' summary of its action stated:

> NMFS is establishing a framework to implement the Washington coastal treaty Indian tribes' rights to harvest Pacific groundfish. NMFS also announces the allocation of 15,000 metric tons (mt) of Pacific whiting *to the Makah Indian Tribe (Makah)* for 1996 only, under the provisions of the regulatory framework.

Id. at 28,786 (emphasis added).

NMFS explained the basis for the whiting allocation in a section of the Federal Register notice entitled "**Allocation of Pacific Whiting *to the Makah*.**" *Id.* at 28,787 (emphasis added). NMFS explained that the allocation followed Makah's June 1995 announcement that it intended to exercise its treaty right to harvest Pacific whiting. *Id.* According to NMFS, after Makah's announcement NMFS published a proposed framework rule to accommodate the tribal right to harvest groundfish "and sought public comment on the amount of whiting that should be set aside for *exclusive harvest by the Makah* in 1996." *Id.* (emphasis added). NMFS stated that, although NMFS and Makah disagreed "on the appropriate quantification of the *Makah treaty right* to Pacific whiting," NMFS adopted "a compromise proposal *by the Makah* that reflected the minimum amount of whiting necessary to initiate a fishery in 1996 *by the Tribe*." *Id.* (emphasis added); *see also id.* at 28,791-28,793 (discussing quantification of Makah treaty right and concluding that "15,000 mt allocated *to the Makah* for 1996 . . . is within the range of the treaty right") (emphasis added).

These statements make it clear that the 1996 Indian treaty allocation in the Pacific whiting fishery was based on a request from the Makah Tribe, was intended to meet the minimum needs of the Makah Tribe, and was for the exclusive use of the Makah tribe. This is confirmed by another feature of NMFS' June 6, 1996, rulemaking. To accommodate rockfish bycatch in the Makah whiting fishery, NMFS adopted a provision authorizing "*Makah* tribal members" to use midwater trawl gear to take and retain groundfish for which there is no tribal allocation, subject to the trip landing and frequency and size limits applicable to the limited entry fishery." 61 Fed. Reg. at 28,787 (emphasis added). As codified by NMFS, this provision applied *only* to Makah tribal members. *Id.* at 28,795 (§ 663.24(k)).

The reason the whiting allocation and midwater trawl rule were limited to the Makah Tribe is that the Makah Tribe was the only tribe seeking to participate in the whiting fishery. Under the Framework Regulation adopted by NMFS, treaty rights to harvest groundfish would be implemented "either through an allocation of fish that will be managed by the tribes, or through regulations in this section that will apply specifically to the tribal fisheries." *Id.* (§ 663.24(d)). Such an allocation or regulation would be "initiated by a written request from a Pacific Coast treaty Indian tribe to the Regional Administrator" and developed "in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus." *Id.* Because Makah was the only tribe seeking to participate in the whiting fishery, the whiting allocation and midwater trawl rule were limited to the Makah Tribe.

The 1997 Allocation.

Administrative Proceedings.

In the Fall of 1996, the Makah Tribe made a two-year interim allocation proposal for its whiting fishery under the Framework Regulation. In a November 7, 1996, letter to NMFS, Makah summarized the results of its 1996 fishery and explained the basis for its proposal for 1997 and 1998:

> [I]n May 1996 the Tribe received an initial allocation of 15,000 metric tons to begin its whiting fishery. This represented approximately 7.1% of the 1996 U.S. harvest guideline of 212,000 metric tons. The Makah fishery took place in the summer of 1996, with a brief "mop-up" fishery in October. The fishery was very successful, fully harvesting the 15,000 ton allocation. Three tribal members acquired boats and gear to participate in the fishery. Dozens of tribal members obtained jobs on the catch[er] boats or on the processor serving the tribal fishery. Our experience in the first year confirms that the whiting fishery can be an important source of badly needed employment and income on our remote reservation.
>
> We are now preparing for the second year of the fishery, to take place in 1997, and have sought an allocation of 25,000 metric tons. This would represent about 10.8% of the 1997 U.S. harvest guideline of 232,000 metric tons. This modest increase in the Makah allocation is extremely important to our ability to develop the fishery. It would enable one or two new boats to enter the fishery, which, in turn, would enable us to more closely manage the fishery to reduce bycatch. With the addition of one or two boats, our management staff can use time, area or depth restrictions to try to avoid bycatch without disrupting the economic viability of the whiting operation.

Makah also noted that, using a three-part test employed by NMFS in 1996, its proposal did not present a conservation concern but, to the contrary, had important conservation benefits as a result of the age and size of fish in the Makah fishing area. In order to give the parties time to continue discussing a long-term solution to the allocation issue, Makah proposed that its allocation should remain at 10.8 percent of the harvest guideline in 1998.

As in 1996, Makah was the only tribe seeking to participate in the whiting fishery in 1997 or 1998. No other tribe made a request for an allocation in the whiting fishery in 1997 or 1998 under the Framework Regulation.

NMFS announced the 1997 allocation along with other groundfish specifications in a January 6, 1997, Federal Register notice. *See* 62 Fed. Reg. 700 (Jan. 6, 1997). At the outset, NMFS noted that it had "received three public comments regarding the allocation of Pacific whiting (whiting) *to the Makah Indian Tribe* prior to publication of these specifications," and stated that it was addressing those comments in Part V of its notice. *Id.* at 700 (emphasis added). In Part V, NMFS explained that it could not accept the Council's recommendation that "no whiting be allocated *to the Makah Tribe* in 1997," and found that "the *tribal proposal* of 25,000 mt (10.8 percent) in 1997 to be an acceptable compromise given all of the uncertainties." *Id.* at 708 (emphasis added). According to NMFS, this short-term compromise was "not intended to set a precedent regarding either quantification of *the Makah treaty right* or future allocations." *Id.* (emphasis added). NMFS added that, in the absence of a resolution of the appropriate allocation in 1998, "NMFS may again provide the tribes 10.8 percent of the U.S. HG." *Id.*

Notwithstanding the reference to the "tribal proposal" and to the possibility of "again" providing the "tribes" 10.8 percent of the harvest guideline in 1998, the entire context of NMFS' discussion makes it clear that it was considering *Makah's* interim allocation proposal and had decided to make an allocation to the *Makah* tribe alone on the basis of that proposal. The "tribal proposal" of 25,000 metric tons or 10.8 percent of the harvest guideline was the Makah Tribe's proposal, and it was based on the needs of the Makah Tribe's fishery and on the whiting available in the Makah Tribe's fishing area. NMFS referred specifically to public comments on the allocation "to the Makah Indian Tribe," the Council's recommendation regarding the amount of whiting to allocate "to the Makah Tribe," and NMFS' intention not to set a precedent regarding quantification of the "Makah treaty right." Moreover, the provision for tribal members to use midwater trawl gear to harvest groundfish for which there is no tribal allocation, although recodified at 50 CFR § 660.324(k), remained limited to *Makah* tribal members. *Id.* at 717.

Judicial Proceedings.

Any doubt regarding NMFS' intention in making the 1997 allocation was resolved in *United States v. Washington*. On February 5, 1997, the Quileute Indian Tribe filed a motion to amend and supplement its response to the Makah Tribe's pending request for determination regarding Pacific whiting in Subproceeding 96-2. Quileute explained that, as stated in the 1996 rule, Quileute understood "the 1996 treaty whiting allocation was strictly proposed for the Makah Tribe alone under its treaty rights." Memorandum in Support of Motion to Amend at 3. However, referring to the language in the 1997 Federal Register notice quoted above ("in 1998, NMFS may again provide the tribes 10.8 percent of the U.S. HG"), Quileute stated it "appears that NMFS has established its 1997 compromise with the Makah as a treaty allocation the four Washington Coastal Treaty Tribes." *Id.* at 4.

Quileute stated that it "did not agree that 10.8 percent of the U.S. harvest guideline is an appropriate allocation for all four coastal Tribes . . . ." *Id.* Accordingly, based on its assumption that NMFS had made an allocation to all four coastal tribes, Quileute sought to supplement its response to challenge to the 1997 allocation. *Id.*[2]

In opposing Quileute's motion, the United States asserted that the motion was "founded on a misunderstanding of the import of the challenged rule which likely arises from an unfortunate typographical error." United States' Opposition to Motion to Amend at 2. According to the United States, "[t]he Quileute Tribe has never, to date, sought an allocation of whiting and therefore *the regulation did not purport to address an allocation of whiting to any tribe other than Makah.*" *Id.* (emphasis added). The United States went on to state:

> In 1996, and again in 1997, the Secretary of Commerce published regulations which set aside *for the Makah Tribe* an allocation of Pacific Whiting. 61 Fed. Reg. 28786 (June 6, 1996), 62 Fed. Reg. 700 (January 6, 1997). In *both cases, the Makah allocation* was based on a compromise intended to allow the parties time to work out the complex legal and factual issues involved in determining the appropriate allocation. As the Quileute Tribe correctly states, *no tribes other than Makah sought whiting allocations* in either 1996 or 1997, and so the quantification *did not address any tribe other than Makah.*
>
> * * *
>
> The 1997 Compromise Treaty Allocation is for *the Makah Tribe Alone*. Quileute's fears that the 1997 regulation appl[ies] to all treaty tribes instead of just to Makah are unfounded. They are apparently the result of an unfortunate typographical error which said the 10.8% treaty allocation would be for the *tribes* rather than for the *tribe*. Based on this typographical error, the Quileute Tribe assumes that the 1997 allocation is for all four coastal tribes. *This assumption is not correct. Only the Makah Tribe* expressed the intent to exercise its treaty right to harvest whiting and

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[2] Quileute also sought to amend its response to "agree[] with the methodology proposed by NMFS to determine the Makah Tribe's treaty share in so far as that methodology is based on a determination of the proportion of the available coastwide Pacific whiting biomass found in the Makah usual and accustomed area." Proposed Amended and Supplemental Quileute Response to Makah RFD re: Whiting at 2 (Feb. 5, 1997). As discussed below, NMFS ultimately rejected the "biomass" approach to quantifying Makah's treaty right on the grounds that it was not required for conservation, underestimated the quantity of fish that pass through the tribe's usual and accustomed fishing area, and illegally discriminated against the treaty fishery, and the courts upheld this determination. Based on the April 20, 2008, letter from Quileute's attorneys, it appears that Quileute has abandoned its prior support for the biomass methodology.

> *only Makah* asked for an allocation in 1997 pursuant to the tribal groundfish framework rule found at 50 C.F.R. 660.324(d). . . .
>
> In short, NMFS did not conclude that 25,000 mt., or 10.8% of the harvest guideline, is the appropriate allocation for all four treaty tribes, nor did NMS base the allocation on the biomass available in the usual and accustomed fishing areas of the four tribes. The 1997 allocation is a short-term compromise allocation *to the Makah – nothing more.*

Id. at 3, 5-6 (some emphasis added).

The assurances provided by the United States in its response were apparently satisfactory to Quileute. On March 12, 1997, it entered into a stipulation with the United States withdrawing its proposed challenge to the 1997 allocation (but not its support for the biomass methodology; *see* note 2 above).

The 1998 Allocation.

Makah remained the only tribe seeking a whiting allocation in 1998 under the Framework Regulation. Consistently with its two-year interim allocation proposal, Makah sought a 1998 allocation of 10.8 percent of the harvest guideline. Because the harvest guideline was the same in 1998 as it had been in 1997, Makah again sought an allocation of 25,000 metric tons.

NMFS announced the 1998 allocation in a January 6, 1998, Federal Register notice. *See* 63 Fed. Reg. 419 (Jan. 6, 1998). The notice explained that "treaty Indian fisheries for sablefish, black rockfish, and whiting are separate fisheries, not governed by the limited entry or open access regulations or allocations." *Id.* at 442. It described the rules governing tribal fishing for rockfish with fixed gear, including a tribal trip limit for thornyheads taken with longline gear. *Id.* NMFS then noted that "[f]or other groundfish species, *Makah* tribal members may use midwater trawl gear to take and retain groundfish for which there is no tribal allocation; those who do so will be subject to the trip landing and frequency and size limits applicable to the limited entry fishery (50 CFR 660.324(k))." *Id.* (emphasis added).

Next, NMFS stated that "[t]he *tribal* allocations for black rockfish and whiting are the same in 1998 as in 1997, and are based on the same rationale. The whiting allocation remains in effect as discussions on the quantification of the treaty right continue in 1998." Given the context from 1997, the fact that Makah had made a two-year interim allocation proposal for 1997 and 1998, the Government's explicit assurances in Court that the 1997 allocation was for the Makah Tribe alone, the on-going discussions between NMFS and Makah over the appropriate quantification of the Makah treaty right, and the fact that no other tribe had sought an allocation in 1998, it is clear that this reference to the 1998 "tribal" whiting allocation was to an allocation for the Makah Tribe alone.

To remove all doubt, NMFS stated:

> For the reasons stated above, the Assistant Administrator (AA) announces the following *tribal* allocations for 1998, including those that are the same as in 1997: . . .
>
> Whiting: 25,000 mt *for the Makah tribe* in 1998, 10.8 percent of the HG.

Id. (emphasis added).

In sum, Makah remained the only tribe seeking to harvest whiting under the Framework Regulation, and the allocation and midwater trawl rule continued to be limited to the Makah Tribe alone. The allocation itself was based on Makah's proposal and was designed to meet the needs of the Makah fishery. The fact that NMFS referred to the whiting allocation as one of several "tribal" allocations did not change the fact that the whiting allocation was made expressly to the Makah Tribe alone.

The 1999 Allocation.

<u>*Administrative Proceedings.*</u>

In 1998, the Quileute Tribe expressed interest in participating in the whiting fishery commencing in 1999. On May 8, 1998, Makah made a written five-year proposal for Makah and Quileute harvests in the Pacific whiting fishery, to cover the period from 1999 to 2003. As explained in its May 8, 1998, memorandum, Makah prepared the proposal after consulting with the Quileute Tribe regarding Quileute's planned participation in the fishery. Makah also had consulted with the Hoh Indian Tribe and the Quinault Indian Nation, and had been informed that Hoh had no present plans to participate in the whiting fishery and that Quinault had made no determination regarding its participation in the fishery.

The 1998 proposal called for separate allocations to Makah and Quileute. Makah's allocation would be based on the U.S. harvest guideline each year; if the harvest guideline were 145,000 metric tons or less, the Makah allocation would be 17.5 percent of the harvest guideline; if the harvest guideline were from 145,001 to 200,000 metric tons, the Makah allocation would be 25,000 metric tons; if the harvest guideline were from 200,001 to 250,000 metric tons, the Makah allocation would be 30,000 metric tons; and if the harvest guideline was over 250,000 metric tons, the Makah allocation would be 35,000 metric tons. In contrast, the proposed Quileute allocation would be 2,500 metric tons per year, regardless of the harvest guideline.

Makah and Quileute clearly contemplated that these allocations would be separate allocations to be separately managed by each tribe. The proposal stated that if Quileute could not fully utilize its allocation, the unused portion would be released to the Makah fishery (there was no proposal for the release of the Makah allocation to Quileute). Both tribes proposed that bycatch in their whiting fisheries would be subject to the same trip landing and frequency and size limits adopted for the non-treaty limited entry fishery until specific treaty allocations or harvest specifications for bycatch species were determined. However, for its fishery, Makah proposed that instead of requiring the discarding of fish in excess of those limits, such fish would be retained and forfeited to the Tribe for charitable, non-commercial uses. Makah explained that this would provide a disincentive to harvesting these fish (since they would have to be handled, stored and off-loaded by the catcher and processor without remuneration), would provide more accurate accounting of bycatch, and would avoid waste. There was no similar proposal for the Quileute fishery.

Makah stated that it assumed there would be no objection to "the small allocation sought by the Quileute Tribe," and thus devoted the remainder of its memorandum to the proposed Makah allocation. The memorandum addressed Makah's proposal from a conservation and allocation perspective in the context of the Makah fishery in the Makah fishing area, giving particular emphasis to the migration of older, larger fish to the Makah fishing area and the conservation benefits of harvesting such fish as opposed to younger, smaller fish in areas to the south. The proposed Makah allocation was not based on the needs of other tribes or on fish available in the fishing areas of other tribes. As Makah explained:

> The Makah proposal is driven by the Tribe's needs for the maintenance of a commercial maritime economy. As has been the case in other coastal fishing communities, the Tribe has witnessed a dramatic decline in its salmon fisheries and is now facing a devastating reduction in its black cod fishery, and must actively participate in groundfish and other fisheries in order to survive. Its experience over the past two years has shown that the harvest levels proposed in this memorandum can support a viable treaty fishery with vessels wholly owned and crewed by tribal members. This limited diversification of the Tribe's fishing economy is essential to provide jobs and income to tribal members and to maintain its maritime industry. Under the Supreme Court's decisions, the Tribe's proposed harvest levels are reasonable and well within its treaty entitlement.

On August 14, 1998, representatives of the National Marine Fisheries Service, the Bureau of Indian Affairs, the Washington Department of Fish and Wildlife, the Oregon Department of Fish and Wildlife, and the Makah, Quileute and Quinault tribes met to discuss Makah's May 8, 1998, proposal. As a result of suggestions from the other participants in the meeting, Makah revised the proposal to limit it to three years (1999 – 2001), added a series of "re-openers" – conditions under which the proposed allocations could be reconsidered during the course of the three-year period – and changed the proposed Makah allocations to add additional breakpoints. The proposed allocations as revised were set forth in the following table:

U.S. Harvest Guideline	Makah Allocation	Quileute Allocation
Up to 145,000 mt	17.5% of U.S. Harv. Guide.	2,500 mt
145,001 to 175,000 mt	25,000 mt	2,500 mt
175,001 to 200,000 mt	27,500 mt	2,500 mt

200,001 to 225,000 mt	30,000 mt	2,500 mt
225,002 to 250,000 mt	32,500 mt	2,500 mt
Over 250,000 mt	35,000 mt	2,500 mt

One of the re-openers made it clear that the proposal involved only allocations to the Makah and Quileute tribes, not to the other coastal tribes (Quinault and Hoh). It provided that the agreement could be re-opened if "the Hoh Indian Tribe or the Quinault Indian Nation seeks an allocation to participate in the Pacific whiting fishery."

NMFS announced the 1999 tribal whiting allocation in a May 24, 1999, Federal Register notice. *See* 64 Fed. Reg. 27,928 (May 24, 1999). NMFS noted that, in 1999, "the Quileute treaty tribe for the first time joined the Makah tribe in expressing interest in whiting, and the two tribes submitted a proposal for determining annual tribal allocations." *Id.* at 27,929. NFMS set forth the tribal proposal, but added a column showing the total allocation derived by adding the Makah allocation and the Quileute allocation together. *Id.* NMFS stated that it "believes that the intertribal distribution of the overall tribal allocation is an internal tribal issue, and herein issues only a total allocation for the affected tribes." *Id.*

However, NMFS then noted that, at the March 1999 Council meeting, "the Quileute indicated that they would not be harvesting whiting in 1999." *Id.* According to NMFS, "[t]his reduced the tribal proposal for 1999 by 2,500 mt.," and resulted in a revised tribal proposal, based on a U.S. optimum yield of 232,000 mt, of 32,500 metric tons. *Id.* As set forth above, this was the amount proposed by Makah for its own allocation.

Since Makah was again the only tribe requesting an allocation, NMFS' issuance of "a total allocation for the affected tribes" was, once again, an allocation for the Makah Tribe alone. NMFS made this clear throughout its Federal Register notice. First, in explaining the amount of the tribal allocation, NMFS stated it "believes the *Makah* have a treaty right to harvest half of the harvestable surplus of whiting found in *the tribe's* usual and accustomed fishing area" and that, under applicable legal principles, "the question becomes one of attempting to determine what amount of fish constitutes half the harvestable surplus of Pacific whiting *in the Makah's usual and accustomed fishing area,* determined according to the conservation necessity principle." *Id.* at 27,930 (emphasis added). NMFS stated this was a difficult issue but concluded that "[t]he *Makah* have made a proposal for 32,500 mt of whiting in 1999 that NMFS accepts as a reasonable accommodation of the treaty right for 1999 in view of the remaining uncertainty surrounding the appropriate quantification." *Id.* (emphasis added). It added that this amount was "not intended to set a precedent regarding either quantification of the *Makah* treaty right or future allocations." *Id.* (emphasis added).

Second, in responding to comments that challenged the existence of a treaty right to whiting, NMFS pointed to the Ninth Circuit's decision in the shellfish litigation, in which the court held that the tribes have treaty rights to all species of fish in their usual and accustomed fishing areas, and noted that "[t]his would cover the *Makah* treaty right to whiting." *Id.* (emphasis added). Similarly, NMFS rejected the argument that a passage from the legislative history of the Magnuson-Stevens Act "provides a basis to deny a whiting allocation to the *Makah* tribe." *Id.* at 27,931 (emphasis added). In these passages, NMFS made it clear that what was at issue was an allocation to the Makah Tribe, not an allocation to the other coastal tribes.

NMFS made this point absolutely clear in the following passage:

> Comment 4: Commenters objected to allocation of whiting to the Hoh, Quileute, and Quinault tribes because the courts have not adjudicated the western boundary of their usual and accustomed fishing areas.
>
> Response: The only one of these three tribes that had requested an allocation for 1999 was the Quileute Tribe. However, the Quileute tribe has since advised NMFS it does not plan to harvest whiting in 1999, and is not seeking an allocation in 1999. Therefore, in 1999, *the only tribal allocation of whiting is for the Makah Tribe.*

Id. (emphasis added).

Finally, in announcing specifications and allocations for the 1999 whiting fishery, NMFS added the following provision regarding the "tribal allocation": "The allocation of whiting is 32,500 mt *for the Makah Tribe.*" *Id.* at 27,933 (emphasis added).

Judicial Proceedings.

Midwater Trawlers Cooperative and others filed a lawsuit to challenge the 1999 allocation. The lawsuit confirmed that the 1999 allocation was an allocation for the Makah Tribe only. Indeed, the Quileute and Quinault tribes themselves took this position during the course of the lawsuit.

In its lawsuit, Midwater Trawlers challenged the definition of the Quileute, Hoh and Quinault tribes' usual and accustomed fishing areas as set forth in the Framework Regulation. Quileute and Quinault jointly filed an *amicus* brief in the Ninth Circuit Court of Appeals which addressed this issue. They pointed out that, as of April 2001 when the brief was signed, the Secretary had not allocated *any* whiting to Quileute, Hoh or Quinault:

> The Secretary made an initial allocation of 15,000 mt of Pacific whiting to the *Makah Tribe*. 61 Fed. Reg. at 28787. The Secretary, however, made *no initial allocation of Pacific whiting to the Quileute, Hoh or Quinault Tribe. See id.* at 28786-28787. *To this day neither the Quileute, Hoh nor Quinault Tribe has received any allocation of Pacific whiting*, and *no allocation of whiting has been based on the scope of their U&As. See* 64 Fed. Reg. at 27931 (Makah SER 26).

Quileute and Quinault *Amicus* Br. at 12 (emphasis added).

On the basis of these facts, Quileute and Quinault argued that Midwater Trawlers *could* challenge the allocation of whiting to the *Makah Tribe*, but *could not* challenge the description of the *Quileute, Hoh, or Quinault* usual and accustomed grounds. They explained:

> Midwater has standing to challenge the *allocation of Pacific whiting to the Makah Tribe* because this allocation results in a reduction in the non-treaty whiting allocation. *Washington v. Daley,* 173 F.3d 1158, 1165 (9th Cir. 1999). By contrast, *Midwater has alleged no injury from the description of the Quileute, Hoh and Quinault U&As in the Framework Regulation.*
>
> * * *
>
> The Secretary has *never made any whiting allocation to the Quileute, Hoh and Quinault tribes* and *has not based any whiting allocation on the scope of their U&As as described in the Framework Regulation.* Moreover, there is *no evidence that a whiting allocation to any of these tribes is imminent. See* 64 Fed. Reg. at 27931 (Makah SER 26). Midwater's challenge to the description of the U&As of the Coastal Tribes is therefore a request for an advisory opinion from this Court on an issue that is not ripe for decision. *See Aetna Life Ins. Co. v. Haworth*, 300 U.S. 227, 240-41 (1937).

Quileute and Quinault *Amicus* Br. at 13, 15 (emphasis added).

The Ninth Circuit agreed with Quileute and Quinault's argument. It held that Midwater Trawlers could not challenge the description of the Quileute, Hoh or Quinault usual and accustomed grounds in the Framework Regulation because the Secretary had not allocated any whiting to them. The Court explained:

> Midwater lacks standing to challenge that portion of the Framework Regulation that identified U & A areas for the Hoh, Quileute, and Quinault Tribes beyond three miles. In order to have standing, a plaintiff must have suffered an "injury in fact" – an invasion of a legally protected interest that is (a) concrete and particularized, and (b) actual or imminent, not conjectural or hypothetical. *U.S. v. Hays,* 515 U.S. 737, 743 (1995). Although none of the tribes disclaims its right to seek an allocation through the Framework Regulation in the future, *the NMFS has not allocated any Pacific whiting to them.* Thus, any injury Midwater suffered in connection with the Hoh, Quileute, and Quinault Tribes was "conjectural or hypothetical" rather than "actual or imminent." In short, *Midwater has not suffered the requisite injury in fact and lacks standing to challenge the portion of the regulation identifying U & As with respect to*

> *the Hoh, Quileute, and Quinault Tribes.* Thus, *the only tribal allocation properly at issue is that to the Makah Tribe.*

Midwater Trawlers Co-operative v. Department of Commerce, 282 F.3d 710, 716 (9th Cir. 2002) (emphasis added).

Quileute's Arguments.

As noted in the text of our memorandum, in their April 10, 2008, letter to Mr. Lohn, Quileute's attorneys cite two statements relating to the 1999 allocation to argue that the allocation was an "overall" allocation available to all four coastal tribes. First, they point to NMFS' statement in its May 24, 1999, Federal Register notice that "NMFS believes that the intertribal distribution of the overall tribal allocation is an internal tribal issue, and herein issues only a total allocation for the affected tribes." However, as we explained above, NMFS went on to note that Quileute had withdrawn its request for an allocation in 1999 and, therefore, the actual 1999 treaty whiting allocation was *only* for the Makah Tribe since it was the only tribe seeking an allocation. As we noted, NMFS stated explicitly that "[t]he [1999] allocation of whiting is 32,500 mt *for the Makah Tribe.*" 64 Fed. Reg. at 27,933 (emphasis added).

Quileute's attorneys also quote the first sentence in the Ninth Circuit's opinion, in which the Court stated it was considering "a challenge by fishing industry groups and the States of Oregon and Washington to a federal regulation that increased the amount of Pacific whiting fish allocated to *four Indian tribes.*" 282 F.3d at 714 (emphasis added). However, as noted above, later in its opinion the Court stated more precisely that, "[i]n 1999, Midwater and Oregon challenged in Oregon federal district court another NMFS regulation, which increased the 1999 amount of Pacific whiting allocated *to the Makah Tribe* to 32,5000 metric tons." *Id.* at 716 (emphasis added); *see also id.* at 715 (Framework Regulation "made a specific allocation of 15,000 metric tons of Pacific whiting *to the Makah Tribe* for 1996) (emphasis added). Moreover, any ambiguity created by the Court's opening statement is resolved by the Court's *holding* with respect to Midwater Trawlers' standing to challenge the description of Quileute, Hoh and Quinault's usual and accustomed grounds. As discussed above, the holding was based explicitly on the fact that the Secretary had allocated *no* whiting to those tribes. Finally, the Court's discussion of the merits of the 1999 allocation made it clear that it was addressing an allocation to the Makah Tribe alone. The Court stated:

> [W]e conclude that the specific allocation in 1999 *to the Makah Tribe* was inconsistent with the scientific principles set forth in the Magnuson-Stevens Act.
>
> The starting point for any examination of the rightful allocation of Pacific whiting *to the Makah Tribe* must be the tribe's right under the *Treaty of Neah Bay.*

Applying these general principles to the case at hand, *the Makah Tribe* is entitled, pursuant to the *Treaty of Neah Bay,* to one-half the harvestable surplus of Pacific whiting that passes through its usual and accustomed fishing grounds . . . .

The immediate origins of the present controversy date to 1996, when the NMFS sought public comment on its initial proposal to determine *the Makah allocation* based on a "biomass" theory . . . .

The Makah Tribe argued that the NFMS should employ a harvest-based approach . . . based on the Makah Tribe's assertion that the majority of the unitary stock of whiting pass through *the Makah Tribe's usual and accustomed area.*

The NMFS never implemented the biomass-based methodology . . . . Instead, the NMFS and *the Makah Tribe* entered into a compromise agreement, under which *the Tribe* was to be allocated 15,000 metric tons in 1996.

Subsequently, *the tribe* proposed a two-year interim allocation of 10.8% of the United States Harvest Guidelines for 1997 and 1998. After determining that the proposal would have a negligible biological impact, the NMFS approved the proposal

In 1998, *the Makah Tribe* made a five-year compromise proposal to the NMFS, under which *the tribe* would receive a treaty share not to exceed 17.5% of the United States harvest guideline in any one year. In 1999, the NMFS proposed an allocation *to the Makah Tribe,* in accordance with the compromise agreement . . . .

Subsequently, the NMFS published a proposed rule requesting comments on (1) *the Makah Tribe's* sliding-scale proposal, which under the 1999 United States Harvest Guidelines would result in an allocation of 32,500 metric tons, or 14% of the total United States harvest; (2) a "status quo" allocation of 25,000 metric tons.

In an environmental assessment prepared for the 1999 tribal allocation, the NMFS concluded that *the Makah proposal* would have no significant impact on the environment.

In the end, the NMFS approved *the Makah* proposal. . . . In doing so, the agency stated:

> *The Makah* have made a proposal for 32,500 mt of whiting in 1999 that NMFS accepts as a reasonable accommodation of the treaty right for 1999 in view of the remaining uncertainty surrounding the

> appropriate quantification. This 1999 amount of 32,500 mt (14 percent of the 232,000-mt OY) is not intended to set a precedent regarding either quantification of *the Makah treaty right* or future allocations.

> The difficulty with the published justification for the rule is, of course, that it is devoid of any stated scientific rationale. . . . Although the NMFS allocation may well be eminently fair, the Act requires that it be founded on science and law, not pure diplomacy.

> For these reasons, a remand to NMFS is required to either promulgate a new allocation consistent with the law and based on the best available science, or to provide further justification for the current allocation that conforms to the requirements of the Magnuson-Stevens Act and *the Treaty of Neah Bay*.

Id. at 718-21 (emphasis added). The Court's repeated references to the Makah Tribe cannot be dismissed as "passing references" with no legal significance. Throughout this discussion, the Court made *no* reference to allocations to any other tribe or to the rights of any other tribe; what was at issue was an allocation to the Makah Tribe alone.

The 2000 Allocation.

In June 1999, the Hoh Tribe wrote to NMFS to request "a whiting set-aside for the Hoh Tribe" so that it could begin participating in the whiting fishery in 2000. In September 1999, Makah submitted its request for treaty groundfish fisheries pursuant to the Framework Regulation. It proposed that "the Makah set-aside for whiting should be as previously proposed by the Makah Tribe."

In November 1999, the Hoh Tribe wrote to the Pacific Fishery Management Council to confirm its request for a "2000 MT set-aside for Pacific whiting." In support of this small request, Hoh reported that it had negotiated a vessel lease agreement, identifying the lessor and the vessel, stated it had obtained a commitment for shoreside processing with a Westport processor, "details of which we have shared with National Marine Fisheries Service," explained arrangements it had made to crew the vessel, and agreed to "coordinate its participation in the Treaty Whiting harvest with the Makah and other coastal tribes and the Washington Department of Fish and Wildlife." (It should be noted that this is a much more complete and open description of its planned fishery than Quileute has provided for 2009 or that either Quileute or Quinault have provided for 2010.)

No other tribe requested a whiting allocation for 2000. In discussions with NMFS, Makah agreed to support an overall allocation of 32,500 metric tons to accommodate both the Makah and Hoh fisheries. In announcing the allocation, NMFS explained:

> Initially for 2000, the Makah proposed 32,500 mt for the Makah tribe alone, which was based on a long-term proposal developed by the tribe in 1998, which had varying levels of Makah allocation based on the level of the whiting OY. In addition, the Hoh tribe proposed 2,000 mt of whiting for a Hoh fishery. In subsequent discussions with a representative of the Makah tribe, the Makah representative indicated that the tribe is not fully certain that it will harvest the entire 32,500 mt in 2000. This is because the Makah allocation in 1999 was larger than the 1998 allocation and the tribe did not take the entire amount. In addition, because the Hoh fishery is new, and questions have been raised about it, it is uncertain how much of the 2,000 mt requested would actually be harvested. Therefore, NMFS believes the 32,500 mt should be adequate for *the two tribes* in the transitional year of 2000.

65 Fed. Reg. 221, 248 (Jan. 4, 2000) (emphasis added).

To this day, the 2000 allocation has been the only allocation made by NMFS that was intended for another tribe in addition to Makah. In making this allocation, NMFS relied on the tribal proposals, including the understanding that Hoh would only harvest "up to 2000 mt":

> Taking into account the existing case law in U.S. v. Washington, the proposal and supporting arguments of the Makah tribe, the Hoh proposal, the comments from the Council and the public, and the existing uncertainty surrounding the appropriate quantification described above, NMFS is allocating 32,500 mt again in 2000 to the coastal tribes. NMFS anticipates that, based on the tribal proposals, the Hoh tribe will harvest up to 2000 mt and the Makah tribe will harvest the remainder of the allocation. This 2000 amount of 32,500 mt is not intended to set a precedent regarding either quantification of the *Makah or Hoh* treaty rights or future allocations.

Id. (emphasis added). Although NMFS stated that is was allocating 32,500 mt "again in 2000 to the coastal tribes," it is clear that that preceding allocations had been to the Makah Tribe alone; only the *amount* was the same in 1999.

NMFS described the 2000 whiting allocation as a "tribal allocation." *Id.* However, it is clear from the NMFS' discussion that the 2000 allocation was only for the Makah and the Hoh tribes; no other tribe requested an allocation and NMFS' decisions was based explicitly on the Makah and Hoh proposals.

As it turned out, Hoh did not participate in the fishery in 2000. Once again, Makah was the only participant.

The 2001 Allocation.

Makah was the only tribe that sought to participate in the whiting fishery in 2001. NMFS allocated 27,500 mt to Makah based on the tribe's 1998 sliding scale proposal. In announcing the allocation, NMFS stated that it was proposed by "the tribes," but made it clear that Makah was the only tribe proposing to participate in the fishery and that the allocation was for the Makah Tribe alone:

> For 2001, the tribes proposed a Pacific whiting allocation of 27,500 mt, and the Council voted to adopt this proposal. The 2001 allocation is based on a "sliding scale" proposal presented by the Makah Tribe in 1998 that determines the tribal allocation based on the level of the overall U.S. OY. The "sliding scale" was previously used in 1999 and 2000 to determine the tribal allocation. As discussed earlier, the U.S. whiting OY is reduced in 2001, based on lower estimated stock abundance, to 190,400 mt. Under the 1998 Makah "sliding scale" proposal, a 190,400 mt U.S. OY results in a 27,500 mt *Makah whiting allocation*. No other tribes proposed to harvest whiting in 2001.

66 Fed. Reg. 2,338, 2,370 (Jan. 11, 2001) (emphasis added). After discussing the pending litigation concerning existence and quantification of the treaty right, NMFS stated that it "will allocate 27,500 mt of Pacific whiting in 2001 *to the Makah Tribe*." *Id.* at 2,371 (emphasis added). Although NMFS again described the allocation as a "tribal allocation," without specifying which tribe it was for, *id.*, its discussion of the basis for the allocation made it clear it was for the Makah Tribe alone.

The 2002 Allocation.

Makah submitted its proposal for 2002 groundfish fisheries under the Framework Regulation on September 7, 2001. With respect to the whiting fishery, the Tribe stated that "[i]f Makah is the only tribe seeking an allocation of Pacific whiting, the Indian treaty allocation should continue to be governed by Makah's allocation proposal, which was approved by the Court in *United States v. Washington,* Subproceeding 96-2." However, the Tribe added that, "[i]f other tribes seek an allocation of Pacific whiting, the allocation should accommodate the needs of each tribe, consistent with treaty allocation principles." No other tribe requested an allocation in the whiting fishery in 2002.

NMFS announced the 2002 allocation in an April 15, 2002, Federal Register notice. *See* 67 Fed. Reg. 18,117 (Apr. 15, 2002). It began by noting that, since 1999, it had "set the tribal allocation according to an abundance-based sliding scale allocation method proposed by the Makah Tribe in 1998." *Id.* at 18,119. It explained that, under the sliding scale, "the tribal allocation varies in relation to the level of the U.S. whiting OY . . . . For 2002, the Makah Tribe has requested, and the Council has recommended, a tribal allocation of 22,680 mt, using the sliding scale allocation method. No other tribes have requested allocations for 2002." *Id.*

NMFS then noted that the sliding scale had been the subject of two recent court decisions. First, in *United States v. Washington,* 143 F. Supp. 2d 1218 (W.D. Wash.

2001), the Court "considered several scientific affidavits submitted by NMFS *and the Makah Tribe*, and found that 'the allocation agreed on by the Secretary is a lawful exercise of his obligation to comply with the treaties guaranteeing Indian tribes their aboriginal right to take fish at their usual and accustomed fishing grounds.'" 67 Fed. Reg. at 18,119, quoting *United States v. Washington,* 143 F. Supp. 2d at 1224 (emphasis added). Those affidavits concerned the proportion of the Pacific whiting stock that passes through *the Makah Tribe's* fishing area, not the fishing areas of the other coastal tribes. In its decision, the Court stated explicitly that it was addressing *only* the rights of the Makah Tribe in approving the sliding scale allocations:

> Other Indian tribes that have recognized rights to fish for whiting at their usual and accustomed fishing grounds are the Hoh and Quileute Tribes and the Quinault Indian Nation. Because these tribes have not joined in these proceedings and do not, currently, seek to participate in the whiting fishery, *the court need not address their various rights and entitlements.*

United States v. Washington, 143 F. Supp. 2d at 1220 n.1 (emphasis added); *see also id.* at 1223 ("tribal allocation agreed upon by NMFS and *Makah* appears to be wholly whiting *the tribe's* treaty right to a fair share of whiting"; "Oregon also attempts to limit *Makah's* harvest opportunities to a portion of the total number of individual fish that actually enter tribal usual and accustomed fishing grounds") (emphasis added).

Second, NMFS noted the very recent issuance of the Ninth's Circuit's decision regarding the 1999 allocation (discussed above). NMFS explained:

> [T]he Ninth Circuit upheld the tribal treaty right to Pacific whiting, upheld the usual and accustomed fishing area of *the Makah Tribe*, and found that *the Makah Tribe* is entitled, pursuant to the Treaty of Neah Bay, "to one-half the harvestable surplus of Pacific whiting that passes through its usual and accustomed fishing grounds, or that much of the harvestable surplus as is necessary for tribal subsistence, whichever is less." However, the Court also found that the specific allocation in 1999 *to the Makah Tribe* was inconsistent with the scientific principles set forth in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (which requires that NMFS base fishery conservation and management measures on the best scientific information available), because NMFS did not adequately support the 1999 allocation set forth in the 1999 Federal Register document. Accordingly, the Court issued instructions to the District Court to remand to the agency for more specific findings. On remand, NMFS will be required "to either promulgate a new allocation consistent with the law and based on the best available science, or to provide further justification for the current allocation that conforms to the requirements of the Magnuson-Stevens Act and the Treaty of Neah Bay."

67 Fed. Reg. at 18,119 – 18,120.

NMFS stated that, because the Ninth Circuit's decision had just been issued, it had to announce the 2002 allocation before the formal remand took place. *Id.* at 18,120. It then stated it had reviewed the best available scientific information on the distribution and migration pattern of Pacific whiting (including scientific information submitted by NMFS and Makah in *United States v. Washington*), and was relying on that information in making the allocation. *Id.* Based on that information, NMFS concluded that "an allocation of 22,680 mt of Pacific whiting *to the Makah Tribe* in 2002 is within the tribal treaty right as described by the District Court in U.S. v. Washington, Sub-proceeding 96-2, and by the Ninth Circuit in the Midwater Trawlers decision." *Id.* (emphasis added). NMFS added that, [s]ince this [was] the amount requested by *the Tribe*, NMFS also concludes that it is sufficient to meet tribal subsistence needs for 2002, even though it may be less than the full treaty entitlement." *Id.* (emphasis added).

As noted, the scientific information submitted by NMFS and the Makah Tribe in *United States v. Washington* concerned the distribution and migration of whiting in Makah's usual and accustomed fishing area. NMFS' discussion in its 2002 Federal Register notice thus made it clear that the 2002 allocation was for the Makah Tribe alone, that it was based on Makah's request to meet the needs of the Makah fishery, and that it was based on scientific information regarding the distribution and migration of whiting in Makah's usual and accustomed fishing area. Accordingly, although NMFS continued the practice of listing the whiting allocation as a "tribal allocation," *id.* at 18,128, its discussion of basis for the allocation made clear that the 2002 allocation was for the Makah Tribe alone.

The 2003 Allocation.

<u>*Administrative Proceedings.*</u>

The Makah Tribe was again the only tribe seeking a whiting allocation for the 2003 fishery. NMFS' Federal Register notice announcing the allocation explained the basis for its adoption of the Makah proposal – "*25,000 mt to be taken by the Makah Tribe*" – and the basis for its rejection of the biomass methodology. 68 Fed. Reg. 11,181, 11,228 (Mar. 7, 2003) (emphasis added). NMFS' explanation thus made it clear that the 25,000 mt "tribal allocation," *id.*, was being made to and for the Makah Tribe alone.

<u>*Judicial Proceedings.*</u>

Shortly after NMFS announced the 2003 allocation, the United States District Court for the Western District of Washington issued an order in the *Midwater Trawlers* case. The District Court explained that the case was on remand from the Ninth Circuit and involved NMFS' "allocation of the yearly Pacific whiting harvest *to the Makah Tribe.*" *Midwater Trawlers Cooperative v. United States Department of Commerce*, 2003 WL 24011242 at *1 (W.D. Wash. Apr. 11, 2003) (emphasis added). The Court noted that, since the Ninth Circuit's ruling, "NMFS has issued final rules establishing annual allocations of Pacific whiting *to the Makah.*" *Id.* (citing the 2002 and 2003 allocations) (emphasis added).

On the merits, the Court found that the scientific information on which NMFS was relying was the best scientific information available, and that it supported NMFS' decision to make the allocations on the basis of Makah's sliding scale proposal as opposed to the biomass methodology.[3] *Id.* at *2-3. The Court's discussion of the best available scientific information makes it clear that NMFS' allocations, and the Court's decision, concerned on the rights of the Makah Tribe alone:

> According to [the best scientific information available], the bulk of the Pacific whiting stock moves through *the Makah's U & A grounds.* Robinson Decl ¶¶ 27-28; Myers Decl ¶ 18 (Jan. 18, 2001) (filed originally in *U.S. v. Washington*, Subproceeding 96-2) ("The available data suggest that when whiting migrate north, the migrations take place within, not seaward of, *Makah usual and accustomed fishing grounds.* That is, *all migrating coastal whiting are potentially exploitable by the Makah.*") (emphasis added). Accordingly, a sliding scale methodology, which allocates *the Makah's rights* on the basis of the entire U.S. yield, is based on the best scientific information available despite potential gaps and imperfections in the information.

Id. at *3 (emphasis added) (footnote omitted).

The Ninth Circuit affirmed the District Court's decision in 2004. *Midwater Trawlers Cooperative v. Department of Commerce,* 393 F.3d 994 (9th Cir. 2004). The Ninth Circuit's decision, like the District Court's decision, makes it clear that NMFS' allocations were to and involved only the rights of the Makah Tribe. The following excerpts are illustrative:

> [Midwater Trawlers] challenge the Secretary of Commerce's decision to allocate a portion of the U.S. harvest of Pacific whiting *to the Makah Indian Tribe* . . . .
>
> In an earlier appeal in this case, we concluded that [NMFS] had failed to explain its allocation of Pacific whiting *to the Makah Tribe* using the best available scientific information. Accordingly, we remanded for [NMFS] to promulgate a new allocation *to the Makah Tribe* consistent with the law and based on the best available science, or to provide further justification that the current allocation conforms to the requirements of the Magnuson-Stevens Act and the *1855 Treaty of Neah Bay.*
>
> This appeal arises out of a series of four consolidated suits challenging the Secretary of Commerce's decisions to allocate a portion of the U.S.

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[3] As noted above (*see* note 2), the biomass methodology was the approach Quileute supported in 1997.

harvest of Pacific coast whiting *to the Makah Tribe* under the *Treaty of Neah Bay*.

In 1996, the Fisheries Service promulgated a "Framework Regulation," codified at 50 C.F.R. § 660.324, that recognized the treaty rights of four coastal tribes – the Hoh, Makah, and Quileute Indian Tribes, and the Quinault Indian Nation – to harvest groundfish in the tribes' "usual and accustomed" fishing areas. . . . Pursuant to the Framework Regulation, the Department of Commerce has made allocations of Pacific whiting *to the Makah Tribe* every year since 1996.

In its [*United States v. Washington*] subproceeding, the Makah Tribe disagreed with [NMFS] over the method to be used for calculating *the tribe's* allocation of Pacific whiting. The Makah Tribe argued that the biomass method lacked scientific support and disagreed with [NMFS] on the definition of the "harvestable surplus,"

The problem with the biomass method is that it fails to account for the annual migration patterns of Pacific whiting, which can be influenced by ocean conditions, age, and food sources. This means that the abundance of Pacific whiting in a particular area may dramatically differ from day-to-day as the fish migrate for food or because of ocean conditions. Consequently, the biomass's snapshot method will only count those fish present in *the Makah Tribe's usual and accustomed fishing grounds* during the particular survey period, likely resulting in an underestimate of the actual numbers of Pacific whiting passing through *those fishing grounds*.

[T]he Makah Tribe had long argued that a sliding scale methodology provided a better way to calculate *its treaty share* of the annual Pacific whiting harvest. Under the sliding scale method, the amount of Pacific whiting allocated to the tribes varied, based on the amount of the U.S. Optimum Yield. The data supporting this approach indicates that the "bulk" of migratory Pacific whiting pass through *the Makah Tribe's usual and accustomed fishing grounds*, thereby entitling *the Makah Tribe* to fifty percent of the bulk of the migratory Pacific whiting harvest. . . . When estimates of the Optimum Yield are less that 145,000 metric tons ("mt"), *the Makah Tribe* would be allocated 17.5 percent of the Optimum Yield. After the estimate reached 250,000 mt, *the tribe's portion* would remain at 35,000 mt.

Before making the 1999 Pacific whiting allocation, [NMFS] sought public comment on two allocation proposals. One proposal would have kept *the tribe's* 1999 allocation the same as it had been for 1997 and 1998. The other proposal would have relied upon the sliding scale methodology proposed by Makah, which varied *the tribe's allocation* as a percentage of the U.S. Optimal Yield.

[In our 2002 decision], we upheld the Framework Regulation that recognized and implemented the treaty rights of the four coastal tribes to harvest groundfish in their usual and accustomed fishing grounds. *Midwater II*, 282 F.3d at 719 (holding that *the Makah Tribe* is "entitled, *pursuant to the Treaty of Neah Bay*, to one half the harvestable surplus of Pacific whiting that passes through its usual and accustomed fishing grounds, or that much of the harvestable surplus as is necessary for tribal subsistence, whichever is less"). However, we further concluded that the 1999 allocation of Pacific whiting *to the Makah Tribe* did not comply with the Magnuson-Stevens Act because [NMFS] failed to explain the allocation on the basis of the best available scientific information.

Following our remand in *Midwater II*, [NMFS] issued its 2002 Pacific whiting allocation. . . . Additionally, in January 2003, [NMFS] sought public comment on its proposed rule to allocate [the] *Makah Tribe's treaty share* using the sliding scale method. In March 2003, [NMFS] issued its final rules establishing the 2003 allocations of Pacific whiting. . . . In so doing, [NMFS] stated that the allocations were based on the "best scientific information currently available." . . . Again, [NMFS] explained it had

> no additional information that would change the conclusions in the [declarations of William L. Robinson and Dr. Richard D. Methot, Jr., submitted in *Midwater Trawlers Cooperative v. Department of Commerce*] on the distribution and migratory pattern of the [Pacific whiting] stock. Therefore, [NMFS] is relying on the information in those declarations as the best scientific information currently available. Accordingly, [NMFS] finds that the 2003 treaty Indian allocation of Pacific whiting (25,000 mt *to be taken by the Makah Tribe*), which is based on the sliding scale methodology that has been in use since 1999, is based on the best scientific information available, and is within the Indian treaty right as described in *Midwater Trawlers Cooperative v. Department of Commerce*, 282 F.3d 710, 718 (9th Cir. 2002).

According to the district court, the biomass method was not based on the best scientific information available. Rather, the best available scientific information supported the sliding scale method. That information established that most Pacific whiting pass through *the Makah Tribe's usual and accustomed fishing grounds*. In making the 2002 and 2003 allocations, [NMFS] relied on the sliding scale methodology after finding no additional information to change its scientific conclusions regarding Pacific whiting migration patterns. . . . Therefore, the district court

> concluded, "a sliding scale methodology, which allocates *the Makah Tribe's rights* on the basis of the entire U.S. yield, is based on the best scientific information available . . . .
>
> According to [NMFS'] scientists, available data suggests that when Pacific whiting migrate north, their migrations take place within *Makah Tribe's usual and accustomed fishing grounds* such that the bulk of Pacific whiting stock pass through *the tribe's usual and accustomed fishing grounds*. Recognition of this migration pattern is significant because it means that all migrating coastal Pacific whiting are potentially exploitable *by Makah*. Simply put, the biomass method's "snapshot" approach fails to account for this migratory pattern and, thereby underestimates the numbers of fish passing through *the tribe's fishing grounds*.
>
> The sliding scale method, however, does account for the Pacific whiting's migratory patterns and, thus, overcomes the failing of the biomass approach. Under the sliding scale method, *the Makah Tribe* would be allocated a percentage ranging from 14 and 17.5 percent of the U.S. Optimum Yield.
>
> Because the Pacific whiting's migratory pattern takes it through *the Makah Tribe's usual and accustomed fishing grounds, Makah is entitled to fifty percent of all migrating coastal whiting*.
>
> We have previously concluded that *the Makah's treaty rights entitle it to 50 percent* "of the harvestable surplus of Pacific whiting that passes through its usual and accustomed fishing grounds, or that much of the harvestable surplus as is necessary for tribal subsistence, whichever is less." . . . Nothing, however, supports the notion that a tribe is obligated to take its full 40 percent entitlement. That *the tribe* opts to not take its full treaty share does no put [NMFS] in the position of justifying a tribe's lower allocation request. Rather, [NMFS] is required only to support its decision to use the U.S. Optimum Yield as the basis from which to measure *the tribe's* allocation.
>
> By relying on the Optimum Yield, the sliding scale method presumes that the bulk of Pacific whiting passes through and is exploitable *by Makah*. This presumption is supported by [NMFS'] data concerning migration patterns.
>
> We agree with the district court that "a sliding scale methodology, which *allocates the Makah Tribe's rights* on the basis of the entire U.S. yield, is based on the best scientific information available despite potential gaps and imperfections in the information."

Id. at 997 – 1005 & n.11 (emphasis added) (footnotes omitted).

The 2004 Allocation.

Makah was the only tribe to seek a whiting allocation in 2004. Pursuant to the Framework Regulation, we wrote to the Regional Administrator on June 16, 2003, to set forth the Tribe's requests for treaty allocations and regulations in the 2004 groundfish fishery. We stated that the Tribe proposed to continue, with two exceptions, "the treaty regulations and allocations in effect in 2003, "including *the Makah allocation* in the Pacific whiting fishery," with changes to reflect changes in the optimum yields as determined for 2004.

In a proposed rule published on January 8, 2004, NMFS stated that the 2004 tribal whiting allocation would be based on Makah's sliding scale proposal, and would be calculated "once the final whiting OY is determined." 69 Fed. Reg. 1380 (Jan. 8, 2004). NMFS noted that "[n]o other tribes have proposed to harvest whiting in 2004." *Id.*

NMFS adopted a final rule establishing 2004 specifications for the whiting fishery on April 30, 2004. With respect to the tribal allocation, NMFS provided the following background:

> A tribal allocation is subtracted from the species OY before limited entry and open access allocations are derived. The tribal whiting fishery is a separate fishery, and is not governed by the limited entry or open access regulations or allocations. To date *only the Makah Tribe has participated. It regulates, and* in cooperation with NMFS, *monitors this fishery so as not to exceed the tribal allocation.*

69 Fed. Reg. 23,667, 23,669 (Apr. 30, 2004) (emphasis added). NMFS then noted that the treaty allocations were still the subject of pending litigation but that, since 1999, it had "set the tribal allocation according to an abundance-based sliding scale allocation method, proposed by the Makah Tribe in 1998." *Id.* NMFS stated that, using this method, the 2004 tribal allocation would be 32,500 mt, and noted that the Makah were "the only Washington Coast tribe that requested a whiting allocation for 2004." *Id.*

NMFS' statement that the Makah Tribe regulated and monitored the fishery "so as not to exceed the tribal allocation" makes it clear that NMFS understood that the tribal allocation was only available to the Makah Tribe. If other tribes could participate in the fishery without first making a proposal to do so under the Framework Regulation, Makah could not regulate or monitor the fishery to remain within the tribal allocation.

The 2005 – 2008 Allocations.

Commencing with 2005-2006, NMFS began adopting biennial specifications in the groundfish fishery. On April 1, 2004, we wrote to NMFS setting forth Makah's proposals for treaty fishery allocations and regulations in 2005 and 2006, "including the Makah allocation in the Pacific whiting fishery." NMFS published a proposed rule for the 2005-2006 specifications on September 21, 2004. 69 Fed. Reg. 56,550 (Sept. 21, 2004). NMFS provided the same information as it had in its January 8, 2004, proposed rule, and again noted that no tribe other than Makah "proposed to harvest whiting in 2005 or 2006." *Id.* at 56,570.

NMFS published final rules for the 2005 and 2006 whiting fisheries on May 3, 2005, and May 22, 2006, respectively. In each year, it stated that tribal allocation was based on the sliding scale methodology and that "[t]he Makah are the only Washington Coast tribe that requested a whiting allocation" for the year in question. 70 Fed. Reg. 22,808, 22,809 (May 3, 2005); 71 Fed. Reg. 29,257, 29,259 (May 22, 2006).

On August 31, 2005, NMFS adopted an emergency rule to establish a salmon conservation zone for the non-treaty Pacific whiting fishery. 70 Fed. Reg. 51,682 (Aug. 31, 2005). In announcing this rule, NMFS noted that, [o]f the four groundfish treaty tribes, only the Makah Tribe conducts a whiting fishery." *Id.* at 51,684. NMFS stated that it had consulted with the Makah Tribe regarding salmon bycatch and that the Tribe was "implementing tribal fishery regulations to close *the tribal whiting fishery* shoreward of 100-fm (183-m) and is beginning testing a salmon bycatch excluder device that has been successfully used to exclude salmon bycatch in Alaska Pollock fisheries." *Id.* (emphasis added).

NMFS' approach was consistent with its understanding that the tribal whiting allocation was available only to the Makah Tribe. If any coastal tribe could enter the whiting fishery at any time, Makah would not have been in a position to adopt fishing regulations "to close the tribal whiting fishery" shoreward of the 100-fm line, and NMFS would have needed to consult with all of the tribes regarding salmon bycatch. Instead, as its annual Federal Register notices make clear, NMFS was relying on the fact that no other tribe had requested a whiting allocation under the Framework Regulation. Until they did so, Makah was the only tribe authorized to participate in the treaty whiting fishery, and the annual allocations were designed solely to meet the needs of its fishery.

This understanding was again confirmed in 2007. Using Makah's sliding scale proposal, NMFS adopted a tribal allocation of 32,500 mt for the 2007 whiting fishery, which was down from 35,000 mt in 2006 due to a reduction in the optimum yield. 72 Fed. Reg. 19,390, 19,392 (Apr. 18, 2007). In so doing, NMFS noted that Makah was the only tribe that had participated in the fishery to date and that it was the only tribe requesting a whiting allocation for 2007. *Id.*

On September 18, 2007, NMFS published a final rule correcting the tribal 2007 allocation because the 2006 amount was still listed in the Code of Federal Regulations. 72 Fed. Reg. 53,165, 53,166 (Sept. 18, 2007). In making this change, NMFS noted that "[t]he Makah tribe is aware of the appropriate 2007 tribal whiting allocation and plans to stay within the 2007 allocation which they proposed; therefore, prior notice and opportunity for public comment is unnecessary." *Id.* Again, NMFS viewed the allocation as an allocation exclusively for the Makah Tribe since no other tribe had requested an allocation for 2007.

NMFS set the 2008 treaty whiting allocation based on Makah's sliding scale proposal. 73 Fed. Reg. 26,325, 26,326 (May 9, 2008). It again noted that Makah was the only tribe to have participated in the fishery to date, that Makah regulates and monitors the fishery "so as not to exceed the tribal allocation," and that Makah was the only tribe that requested a whiting allocation for 2008. *Id.*

Given the history and context of these allocations, it is clear that the recent treaty allocations in the whiting fishery – like all of the treaty allocations since 1996, with a minor exception in 2000 – have been for the exclusive benefit of the Makah Tribe. The other coastal tribes are entitled to request an allocation to participate in the fishery in future years under the Framework Regulation. However, to premise such a request on the claim that the tribal allocations have been for the benefit of all of the coastal tribes all along is contrary to the administrative record that has been compiled since 1996, to repeated court rulings, and to the positions of the tribes (including, in particular, the Quileute Tribe).

Tribal Proposal Regarding Groundfish Fisheries for 2009 and 2010

Black Rockfish - The 2009 and 2010 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 2009 and 2010 tribal set asides for sablefish will be set at 10 percent of the Monterey through Vancouver area OY minus 1.6 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 2009 and 2010.

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. Those limits would be accumulated across vessels into a cumulative fleetwide harvest target for the year. 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

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.

Lingcod - Tribal fisheries will be subject to a 250 mt harvest guideline for 2009 and 2010.

Spiny Dogfish - The Makah Tribe is proposing a directed longline fishery for spiny dogfish for 2009 and 2010. The fishery would be restricted to the Limited Entry trip limits. Increased landings of dogfish by treaty fishermen in 2009 and 2010 would be dependent on successful targeting in 2008 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 2009 and 2010

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.

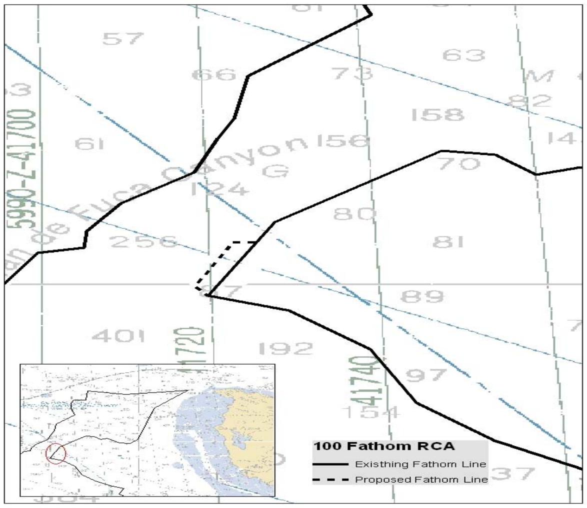
Bottom Trawl Fishery - Treaty fishermen using bottom trawl gear will be subject to the trip limits applicable to the limited entry fishery for shortspine and longspine thornyhead, Dover sole, English sole, rex sole, arrowtooth flounder, and other flatfish. For Dover sole, thornyheads (both shortspine and longspine), 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 (≤ 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.

Agenda Item F.9.b
Supplemental WDFW Report
June 2008

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE REPORT ON MODIFICATION OF THE ROCKFISH CONSERVATION AREAS (RCA) FOR 2009-2010

Washington is proposing to modify the 100-fathom line used to describe the rockfish conservation area off the northern Washington coast. The modification is a minor adjustment to the coordinates currently in place as a possible measure to provide additional protection to yelloweye rockfish. While the projected impacts to yelloweye rockfish are not necessarily quantifiable it is assumed that this modification will provide reduced harvest impacts and additional protection of the yelloweye rockfish resource off Washington.



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE PREFERRED MANAGEMENT MEASURES FOR 2009-2010 RECREATIONAL FISHERIES

The Council adopted a yelloweye OY of 17 mt and a canary OY of 105 mt for both 2009 and 2010. Based on the harvest sharing recommendations provided by the Council the Washington recreational yield amounts for yelloweye and canary rockfish are 2.7 mt and 5.2 mt respectively. The following management measures are designed to reduce the incidental catch of overfished rockfish, primarily yelloweye, while anglers are targeting halibut and lingcod. While these management measures are intended to keep yelloweye impacts within the state harvest share for 2009 and 2010, they will also provide information on how innovative management measures implemented in this management period might reduce yelloweye impacts as the Council moves forward with the yelloweye ramp down in 2011 and 2012.

2009-2010

Bottomfish Area and Retention Restrictions

For all areas in 2009-2010 continue to prohibit the retention of yelloweye and canary rockfish. Prohibit fishing for, retention or possession of bottomfish and halibut in the C-shaped yelloweye rockfish conservation area in the north coast and the offshore rockfish conservation area in the south coast area.

New south coast RCA: Prohibit fishing for, retention or possession of bottomfish and halibut in the area described by the following coordinates:

46°54.30 N. lat.	124°53.40 W. long.
46°54.30 N. lat.	124°51.00 W. long.
46°53.30 N. lat.	124°51.00 W. long.
46°53.30 N. lat.	124°53.40 W. long.

Bag Limits

For both 2009 and 2010, the aggregate bottomfish bag limit is 15, which includes a sub-limit of 10-rockfish and 2-lingcod.

Lingcod

Marine Areas 1-3, open Saturday closest to March 15 through the Saturday closest to October 15
Marine Area 4, open April 16 through the Saturday closest to October 15, or October 15th if the Saturday closest to October 15th falls later than October 15th

North Coast (Marine Areas 3 and 4)

Prohibit the retention of bottomfish seaward of a line approximating 20 fathoms from May 21-September 30, except on days that halibut fishing is open.

South Coast (Marine Area 2)
Prohibit the retention of bottomfish seaward of a line approximating 30 fathoms from March 15-April 30. Prohibit the retention of bottomfish, except sablefish and Pacific cod seaward of a line approximating 30 fathoms from May 1-June 15. Prohibit the retention of lingcod south of 46°58 on Fridays and Saturdays from July 1 through August 31

Columbia River (Marine Area 1)
Prohibit the retention of bottomfish, except sablefish and Pacific cod, with halibut onboard from May 1 through September 30.

Based on the Washington recreational impact model, the estimated mortalities for canary and yelloweye rockfish are projected to be:

	WA Share of Yelloweye	Yelloweye Impacts mt	WA Share of Canary	Canary Impacts mt
2009-2010	2.7	2.5	4.9	1.2

WDFW will track the Washington recreational catch inseason and will take action as appropriate, to ensure these targets are not exceeded.

The Washington and Oregon Departments of Fish and Wildlife have agreed to continue to manage the recreational fishery under shared harvest guidelines for canary and yelloweye rockfish. If inseason catch projections indicate that one or both of the state harvest targets may be exceeded, these Departments will consult with each other 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, and may include consideration of additional depth restrictions, time/area closures, and/or seasonal closures.

Agenda Item F.9.c
Supplemental GAP Report
June 2008

GROUNDFISH ADVISORY SUBPANEL REPORT ON FINAL ADOPTION OF 2009-2010 GROUNDFISH HARVEST SPECIFICATIONS, MANAGEMENT MEASURES, AND REBUILDING PLAN REVISIONS

Set-asides

- The Groundfish Advisory Subpanel (GAP) supports continued yelloweye research and recommends appropriate set-asides of yelloweye rockfish for any exempted fishing permits (EFPs). The set-asides for EFPs should come out of the sector for which the EFP is taking place.

Limited Entry Non-Whiting Trawl

- Management measures – the GAP supports option 1.
- The GAP does NOT support restricting trawlers to one bottom trawl gear on board at a time at this time, and agrees with the Groundfish Management Team (GMT) to revisit this issue in the 2011-2012 specifications process.

Limited Entry Whiting Trawl

- Closing the Whiting Fishery Upon Projected Attainment of a Bycatch Limit – the GAP agrees.
- Maximized Retention for Catcher Vessels Delivering to Motherships – the GAP agrees.
- Unmonitored Midwater Trawling in the Rockfish Conservation Area (RCA) – the GAP agrees with GMT on 100% observer coverage.
- Sector-Specific Bycatch Limits – GAP recommends pro rata approach for sector specific bycatch limits and recommends no overall cap for the whiting fishery.
    - The GAP recommends including regulatory provisions to implement depth-based closures for a specific sector if that sector is projected to hit a cap. This “soft landing” would still protect overfished species while providing opportunity to fully utilize the whiting allocation.
- Changing the at-sea processing restriction in the shoreside whiting fishery – the GAP agrees.

Limited Entry Fixed Gear

- Mandatory logbooks – the GAP agrees.
- Alternative 2 on yelloweye rockfish catch sharing –
    - Ensure that line comes in on halibut days.
    - 125 restriction would be to Cascade Head south.

Nearshore Open Access

- Management measures - the GAP members support the GMT proposals for the 2009-2010 and supports Alternative 2 on yelloweye rockfish catch sharing.

Incidental Open Access

- Retention of lingcod in salmon troll fisheries – the GAP does not support changes to the retention of lingcod in the salmon troll fishery.

Recreational

California

GAP agrees with the GMT recommendations on depth restrictions, season lengths and other management measures.

Oregon

GAP agrees with the GMT recommendations for Oregon sport fisheries.

Washington

GAP agrees with the GMT recommendations for Washington sport fisheries with inclusion of new area restriction Area 9 on Page 83 of Agenda Item F.4.a, Attachment 1. This area closure is for all groundfish and pacific halibut and will help prevent a spike in yelloweye and canary encounters during the directed halibut fishery regardless of its length.

PFMC
06/13/08; 10:33 AM

GROUNDFISH MANAGEMENT TEAM REPORT ON FINAL ADOPTION OF 2009-2010 GROUNDFISH HARVEST SPECIFICATIONS, MANAGEMENT MEASURES, AND REBUILDING PLAN REVISIONS

Under Agenda Item F.4 the Council adopted tentative final OYs and provided the Groundfish Management Team (GMT) direction on catch sharing for yelloweye and canary rockfish to inform development of management measures. The GMT examined the harvest specifications adopted by the Council, estimated the set-asides needed to accommodate tribal fisheries, research catches, Exempted Fishing Permits (EFPs), and incidental catches in non-groundfish fisheries. Management measures were then constructed for each of the non-tribal directed groundfish commercial and recreational sectors based on the shares presented in Agenda Item F.4.b, Supplemental ODFW Report 3 for yelloweye rockfish and the initial 2005 scorecard estimates for canary rockfish.

HARVEST SPECIFICATIONS

Widow and darkblotched rockfish

In the GMT report to the Council (Agenda Item F.4.c, Supplemental GMT Report, June 2008) the team recommended a reduction in the darkblotched OY coupled with an increase in the widow OY. A commensurate change in the darkblotched bycatch limit in 2009-2010 whiting fisheries from 40 mt to 25 mt was recommended to avoid disproportionate impacts to other sectors. The tentatively adopted widow rockfish OYs of 522 mt in 2009 and 509 mt in 2010 are based on the status quo SPR harvest rate ($F_{95\%}$) from the most recent rebuilding analysis (He et al., 2007). The Council's preliminary preferred alternative OY for darkblotched rockfish was reduced by 15 mt to 285 mt for 2009. This tentatively adopted OY assumes an SPR harvest rate of $F_{62.1\%}$, with an associated 2010 OY of 291 mt.

Minor Rockfish Complexes

The minor rockfish complexes are categorized by latitude (north/south of 40° 10′ N latitude) and by the general distribution of species (nearshore, shelf, and slope species), resulting in six minor rockfish complexes. Federal regulations require that harvest of minor rockfish species not exceed the overfishing threshold (ABC) for all minor rockfish complexes combined (Tables 1a and 1b to part 660 subpart G in the Code of Federal Regulations). The ABC is a combined limit for the minor nearshore, minor shelf, and minor slope complexes in each area north and south of 40° 10′ N latitude. For species managed within the complex, federal regulation does not currently require action if harvest of an individual species exceeds an ABC, OY, or harvest guideline assigned to that species alone.

The Council elected to manage blue rockfish as a component of the minor rockfish complex. California amended the initial measure to establish a statewide harvest guideline for blue rockfish of 220 mt, a precautionary adjustment of the ABC in the assessment of 241 mt in 2009 and 239 mt in 2010. This harvest guideline exceeds the 40-10 adjusted OY (207 mt) that would have resulted under a species-specific OY. As part of a complex, no federal action is required if catch of blue rockfish exceeds the harvest guideline or blue rockfish's ABC contribution to the combined minor rockfish ABC. If the adopted harvest guideline is exceeded or projected to be exceeded, California's state regulations (Title 14, California Code of Regulations (CCR)) allow the state to take action to ensure this is not exceeded. These actions include NMFS actions taken at California's request through the Council process for the commercial and/or recreational fisheries. If federal action was taken, California would also take independent action for the recreational fishery through the Commission or by Director's authority depending on the anticipated effective date (Section 52.09, Title 14).

Outside the Council process, California could also take independent action. For the commercial fishery, the Director can close a commercial fishery if a federal OY or HG is exceeded or projected to be exceeded (Section 52.09, Title 14). The Commission can close on emergency basis (Section 240, Fish and Game Code), or on a non-emergency basis under the Commission's general authority (Sections 202 and 205, Fish and Game Code). Alternatively, if the Commission's meeting schedule is not adequate to allow a rule change to occur quickly, the Director can take action to close the fishery on attainment or projected attainment of a Federal OY or HG pursuant to Section 27.20, Title 14, CCR.

Black Rockfish Sharing Between Oregon and California
At its April meeting, the Council adopted a tentative black rockfish sharing framework for 2009-2010, which would need to be adopted under this agenda item to implement in 2009-2010. As in place since 2004, this would 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 580 mt and a California harvest guideline of 420 mt. The states of California and Oregon have factored in precautionary approaches in managing to these black rockfish targets.

YIELD SET-ASIDES

Tribal Fisheries
The Coastal Treaty Tribes are proposing non-whiting groundfish fisheries as outlined in their supplemental report (Agenda Item F.9.b, Supplemental Tribal Report). These management measures can also be found in Section 2.2.4.2 on p.79-80 of Chapter 2 in the DEIS (Agenda Item F.4.a, Attachment 1).

The GMT notes that one change in the set-asides for overfished species from these fisheries compared to status quo is the increased estimate of canary rockfish in the Makah midwater trawl fishery targeting yellowtail rockfish. Due to higher encounters of canary bycatch in recent years, particularly 2007 and 2008, the Tribe has been unable to successfully prosecute the fishery while remaining within the canary estimate provided in the scorecard. The Makah Tribe is proposing a doubling of those estimated impacts (from 1.8 mt to 3.6 mt) to allow for resumption of the fishery given increased availability of canary rockfish yield in 2009-2010.

Tribal Whiting
For tribal whiting, the GMT discussed the proposal by the Quileute Tribe to enter the fishery in 2009 and their estimated Pacific whiting catch of up to 8,000 mt (equal to approximately 3% of the 2008 U.S. OY) as well as the Makah proposal to manage their fisheries to 17.5% of the U.S. OY. The Council requested that the GMT examine estimated overfished species impacts compared across whiting sectors based on treaty tribal allocations of 17.5% and 20.5%.

Given concerns that the inexperience of new entrants to the fishery may result in higher encounters of bycatch species, a precautionary approach to estimating bycatch was sought to minimize impacts to other sectors inseason. The GMT proposes to triple the estimated impacts derived from the weighted average of Makah's bycatch applied to the 8000 mt of whiting estimated to be taken by Quileute. The remaining amount would be calculated with the same (i.e. unadjusted) weighted average approach that has been applied to Makah's fishery in recent years. The tables below (Tables 1a-1c) show this approach under three scenarios: 1a) with a 17.5% treaty tribal allocation should Quileute be unable to prosecute their new fishery in 2009, 1b) with a 17.5% tribal allocation and full prosecution of Quileute's estimated take of whiting, and 1c) a 20.5% tribal allocation with both tribes taking their maximum estimate.

Table 1a. Estimated impacts in metric tons of overfished species in each sector based on the weighted average bycatches applied to the Makah fishery alone with a treaty tribal allocation of 17.5%.

Sector	Canary	Darkblotched	POP	Widow
Tribal	**1.42**	**0.01**	**0.73**	**3.62**
Mothership	2.02	5.95	1.07	116.15
CP	0.25	5.85	1.10	142.11
Shoreside	1.54	2.77	0.33	147.83
Total	5.23	14.58	3.23	409.70

Table 1b. Estimated impacts in metric tons of overfished species in each sector based on tripling the weighted average bycatches applied to a fully prosecuted Quileute fishery and a treaty tribal allocation of 17.5%.

Sector	Canary	Darkblotched	POP	Widow
Tribal	**1.90**	**0.01**	**0.98**	**4.84**
Mothership	2.02	5.95	1.07	116.15
CP	0.25	5.85	1.10	142.11
Shoreside	1.54	2.77	0.33	147.83
Total	5.71	14.58	3.48	410.93

Table 1c. Estimated impacts in metric tons of overfished species in each sector based on tripling the weighted average bycatches applied to a fully prosecuted Quileute fishery and unadjusted weighted average bycatches applied to a fully prosecuted Makah fishery with a treaty tribal allocation of 20.5%.

Sector	Canary	Darkblotched	POP	Widow
Tribal	**2.14**	**0.01**	**1.11**	**5.46**
Mothership	1.94	5.73	1.03	111.89
CP	0.24	5.63	1.06	136.89
Shoreside	1.48	2.67	0.32	142.40
Total	5.81	14.05	3.52	396.65

The GMT recognizes that the Makah have years of experience avoiding bycatch, and that direct application of the rates from their fishery are likely not appropriate for other fisheries. While this approach for estimating impacts to overfished species for the proposed Quileute fishery may not insure against a "disaster tow", it allows for decreased risk to other fisheries should bycatch prove to be considerably higher due to unquantifiable differences in bycatch rates based on vessel, gear, or skipper effects for a new participant. However, the GMT also notes that these impacts likely represent an upper-bound estimate as the Quileute Tribe has indicated that they intend to manage their fishery inseason to avoid bycatch and remain well below the estimates provided here.

Research

The GMT considered catches of overfished species in recent years and ongoing projects that are planned to continue into 2009 and 2010 to determine appropriate amounts to set aside in 2009 and 2010 for scientific research. Based on direction from the Council under Agenda Item F.7, the GMT also examined amounts of anticipated yelloweye impacts that can be attributed to state-sponsored research initiatives.

The International Pacific Halibut Commission (IPHC) survey component took 1.1 mt of yelloweye when using 8 skates of longline gear in 2003 in conjunction with a PIT tagging experiment. For 2008, and possibly in 2009 and 2010, they have reduced the number of skates to 5, which is estimated to result in a proportional decrease to approximately 0.7 mt. In addition, both WDFW and ODFW have proposed yelloweye line surveys that will be conducted in conjunction with the IPHC survey. These projects are capped at 0.9 mt for ODFW and 1.0 mt for WDFW. An additional 0.2 mt is expected from a combination of other research activities. The total estimate of yelloweye projected to be taken in research activities is 2.8 mt.

Exempted Fishing Permits (EFPs)

The GMT examined potential yelloweye savings from reductions in EFP set-asides on a sector-specific basis. Based on the estimates provided by EFP applicants in Agenda Item F.3.a, Supplemental Attachment 7, the GMT corrected the original total of 0.366 mt plus 3 fish in the table to total 0.3 mt. This can be further broken down to approximately 0.08 mt for commercial EFPs and 0.25 mt for recreational EFPs.

Set-Aside Summary

The estimated non-whiting tribal impacts along with the updated estimates of research catch, the tentative EFP set-asides adopted under F.4, and the estimated impacts of non-groundfish fisheries result in the yield set-asides reflected in the following table (Table 2). These estimates are updated from the set-asides originally calculated in Chapter 2 of the DEIS (Agenda Item F.4.a, Attachment 1).

Table 2. Updated summary of yield set-asides by species and sector for 2009-2010 management measure analyses.

Fishery	Bocaccio	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Tribal whiting		**2.1**		**0.0**	**1.1**	**5.5**	**0.0**
Tribal							
Midwater Trawl		**3.6**		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
Open Access: Incidental Groundfish	1.3	0.9	0.0	0.0	0.0	0.4	0.3
EFPs	13.7	2.7	0.3	1.3		5.3	0.4
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	2.0	8.0	0.2	2.0	2.0	1.1	2.8
TOTALS	**17.0**	**18.9**	**0.5**	**3.4**	**6.8**	**52.3**	**5.8**

Incidental Lingcod in the Salmon Troll Fishery North of 42° N Latitude

The Council also requested that the GMT analyze overfished species impacts for a lingcod allowance of "1 lingcod for every 15 Chinook salmon, plus one additional lingcod, not to exceed 10 lingcod per trip, up to a maximum limit of 400 lbs/month" in the salmon troll fishery north of 42° N latitude.

The GMT did not make any adjustment to the scorecard for this proposal. Bycatch rates in the salmon troll fishery are highly uncertain because the fishery is not observed by the WCGOP. The impacts could deviate from what is currently in the scorecard if a significant amount of lingcod targeting was precipitated by the retention allowance.

Table 4-84 in Chapter 4 of the DEIS (p. 155, Agenda Item F.4, Supplemental Attachment 2) calculates: (a) the total lingcod that would be caught on a trip under four bycatch scenarios for a range of Chinook catches; and, (b) the difference between the number of lingcod that would be encountered incidentally and the number that could be landed under the retention allowance. The "1 lingcod for every 15 Chinook salmon, plus one additional lingcod" is represented as "Option 1." Positive numbers indicate lingcod that would be available to target and negative numbers indicate the number that would have to be discarded. A "zero" indicates no difference between the number of lingcod encountered and the number that could be landed. To illustrate, for a trip where 30 Chinook are caught a troller would catch:

- 3 lingcod and have to discard 1 if the bycatch rate was 1 lingcod per 7 Chinook; or
- 0 lingcod, leaving 3 to target, if the bycatch rate was zero.

The GMT does not have the data to estimate the bycatch rate and so cannot rule out targeting or quantify the magnitude of targeting that might occur. Table 4-84 is thus intended to give some means to qualitatively assess that potential magnitude by displaying the targeting opportunities made available by the retention allowance under a reasonable range of bycatch rates.

Table 4-85 (p. 155) displays frequency statistics for landings of Chinook into Washington for 2005-2007. Table 3 below displays the same statistics for landings of Chinook into Oregon.

Table 3. Oregon commercial troll Chinook landings frequency statistics, 2005-2007.

	2005			2006			2007		
Chinook Landed	# of Landings	% of Landings	Cumulative	# of Landings	% of Landings	Cumulative	# of Landings	% of Landings	Cumulative
15	8,622	72.80%	72.8%	3,833	84.89%	84.9%	4,494	88.94%	88.9%
30	1,481	12.50%	85.3%	473	10.48%	95.4%	398	7.88%	96.8%
50	821	6.93%	92.2%	179	3.96%	99.3%	106	2.10%	98.9%
75	435	3.67%	95.9%	28	0.62%	100.0%	37	0.73%	99.6%
100	217	1.83%	97.7%	2	0.04%	100.0%	12	0.24%	99.9%
>100	268	2.26%	100.0%	0	0.00%	100.0%	6	0.12%	100.0%

Both tables show that the majority of landings into Oregon and Washington consist of less than 15 Chinook and over 90% consist of less than 50. The GMT understands that Chinook abundance has been relatively low over this time period. However, if similar patterns held in 2009-10 then the "zero incidental catch" scenario in Table 4-84 shows that no more than 4 lingcod would be available for targeting on 90% of salmon troll trips. Under a bycatch rate of 1 lingcod for every 12 Chinook, no more than 1 lingcod would be available to target and land.

Table 4-86 (p. 155) gives a range of exvessel revenues that could be earned for a retained lingcod. In 2005-2007, the average exvessel price for troll and hook and line caught lingcod was $1.24 per lb.

DIRECTED GROUNDFISH FISHERY IMPACTS

Based on Council direction under Agenda Item F.4, the GMT modeled fishery management measures for the various directed groundfish fishery sectors as reflected in the 2005 column of Agenda Item F.4.b, Supplemental ODFW Report 3 for yelloweye and based on the initial 2005 scorecard for canary rockfish. The shares by sector are shown in Table 4 below.

Table 4. Yield amounts of canary and yelloweye rockfish for directed commercial and state recreational groundfish fisheries based on 2005 sharing scenarios.

Groundfish Sector	**Catch Shares by Sector**	
	Canary 2005	**Yelloweye 2005**
LE Non-Whiting Trawl	19.7	0.3
LE Whiting Trawl	18.0	0.3
LE Fixed Gear	2.5	1.9
Directed OA	2.2	0.5
WA Rec	4.9	2.7
OR Rec	16.0	2.5
CA Rec	22.9	2.8
TOTAL	86.1	11.0

Reductions in Yelloweye Impacts in Offshore Fixed Gear Fisheries
Yelloweye impacts in offshore fixed gear fisheries occur seaward of the non-trawl RCA 100 fm line north of 40°10' N lat. Yelloweye discard rates, based on the aggregate 2002-06 observed discards of yelloweye relative to retained sablefish in limited entry and open access line gear fisheries, were applied to sector sablefish allocations of the 2009-10 sablefish OYs north of 36° N lat. to predict yelloweye impacts for each sector assuming the full allocation of sablefish would be taken. Yelloweye impacts are predicted to be 1.5 mt and 0.4 mt for offshore limited entry and open access fixed gear fisheries, respectively under a status quo 100 fm seaward RCA boundary (see LEFG Alt. 7 in Table 4-77 and OA DTL Alt. 7 in Table 4-80 in Agenda Item F.4.a, Supplemental Attachment 2).

Analyses informing the effect of alternative non-trawl RCA configurations varied seaward extensions of the non-trawl RCA north of 40°10' N latitude to 125 fm and 150 fm for the entire northern boundary and in four subareas bounded by 40°10' N lat.; the Columbia-Eureka line at 43° N lat. near Cape Blanco, Oregon; Cascade Head, Oregon at 45.064° N lat., Pt. Chehalis, Washington at 46.888° N lat.; and the U.S.-Canada border. Yelloweye fixed gear discard rates were highest north of Pt. Chehalis and between Cape Blanco and Cascade Head. Therefore, the GMT considered extending the seaward boundary in these two subareas to reduce yelloweye impacts in accordance with the proposed sharing of the preferred yelloweye OY of 17 mt with minimal disruption of fisheries targeting sablefish and Pacific halibut.

These analyses showed that yelloweye impacts would be reduced in limited entry fixed gear fisheries to 1.2 mt, down from 1.5 mt, if the line was moved from 100 fm to 125 fm in either the area north of Pt. Chehalis or the area between Cape Blanco and Cascade Head (LEFG Alt. 5 and 6, respectively in Table 4-77). Directed open access impacts associated with an RCA extension to 125 fm in either of these two areas was 0.3 mt, down from 0.4 mt (OA DTL Alt. 5 and 6, respectively in Table 4-80).

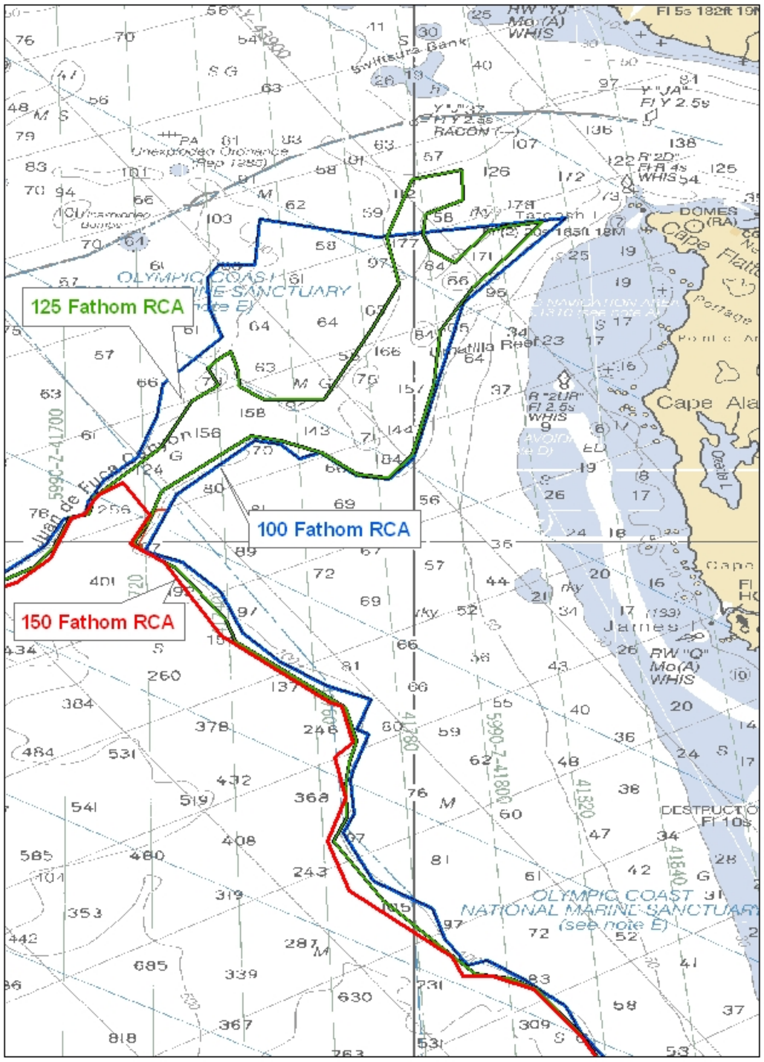
The impacts to target fishing opportunities resulting from these proposed RCA extensions were different depending on which subarea's RCA was extended to 125 fm. Observed amounts of sablefish retained in either subarea caught at various depths indicated a significant amount of sablefish are caught at depths greater than 125 fm, with 79% of all sablefish caught seaward of the RCA in depths greater than 125 fm in the area north of Pt. Chehalis and 76% of all sablefish caught in these deeper depths in the area between Cape Blanco and Cascade Head (Tables 4-28 and 4-29).

While the sablefish fishery may not appear to be impacted by these RCA extensions, there may be differential impacts to fisheries targeting Pacific halibut seaward of the RCA in these two areas. Logbook data provided by the IPHC showing halibut catches in depths of 100-124 fm, 125- 149 fm and ≥150 fm indicated about 70% of the halibut caught north of Pt. Chehalis in 2003-07 were caught deeper than 125 fm (Table 4-79). This compares to the area between Cape Blanco and Cascade Head, where about 41% of the halibut were caught deeper than 125 fm.

One difference between the halibut fisheries seaward of the RCA in these two areas is that all halibut caught north of Pt. Chehalis are incidental to the directed sablefish fishery, which may influence the depths of target fishing. Halibut are directly targeted in fisheries south of Pt. Chehalis and the depth of fishing is more likely influenced by the depth distribution of halibut when the fishery is open than the depth of sablefish. The apparent clustering of halibut targeting closer to the 100 fm line in the area between Cape Blanco and Cascade Head from the IPHC data is validated by comments from commercial fishermen solicited in public meetings sponsored by ODFW as found in Agenda Item F.4.b, Supplemental ODFW Report.

This tradeoff may indicate less of a fishery impact with the same amount of yelloweye savings if the RCA is extended to 125 fm north of Pt. Chehalis rather than in the area between Cape Blanco and Cascade Head. However, further fishery impacts are associated with extending the RCA to 125 fm north of Pt. Chehalis. The directed fishery for spiny dogfish, which occurs in the spring in waters off northern Washington at about the 100 fm contour would likely be eliminated with this RCA extension. Further, fixed gear vessels home porting in Puget Sound may have longer transits to open fishing grounds if the RCA is extended to 125 fm since much of the Juan de Fuca canyon would be closed (Figure 1).

Figure 1. Rockfish Conservation Area boundaries approximating the 100, 125 and 150 fm contours.



The GMT therefore proposes to extend the RCA to 125 fm in the area between Cape Blanco and Cascade Head except on days when the directed halibut fishery is open, when the line would remain at 100 fm, if such a change is needed to reduce yelloweye impacts. The GMT believes there would be very minimal additional yelloweye impacts under this scenario, since the directed halibut fishery in this area typically lasts for 3-6 days. The GMT estimates that 0.4 mt of yelloweye impacts would be saved by this proposal with 0.3 mt of savings in the limited entry fishery and 0.1 mt in open access fisheries.

The GMT also recommends that Council consider adding an exemption for the dogfish fishery to the suite of 2009-2010 management measures to accommodate that fishery under a 125 or 150 fm line north of Pt. Chehalis. The exemption would require participants to make a VMS declaration and fish outside the 100 fm line. Sablefish could not be retained and vessels would need to return to port before re-declaring and setting out on a sablefish trip.

Washington is also proposing to modify the 100-fathom line used to describe the RCA off the northern Washington coast. The modification is a minor adjustment to the coordinates currently in place and was recommended by commercial industry representatives as a possible measure to provide additional protection to yelloweye rockfish (Figure 2, Table 5). While the impacts to yelloweye rockfish are not quantifiable it is assumed that the additional restriction will provide reduced yelloweye impacts.

Figure 2. Chart showing the proposed RCA line revision compared to the existing line.

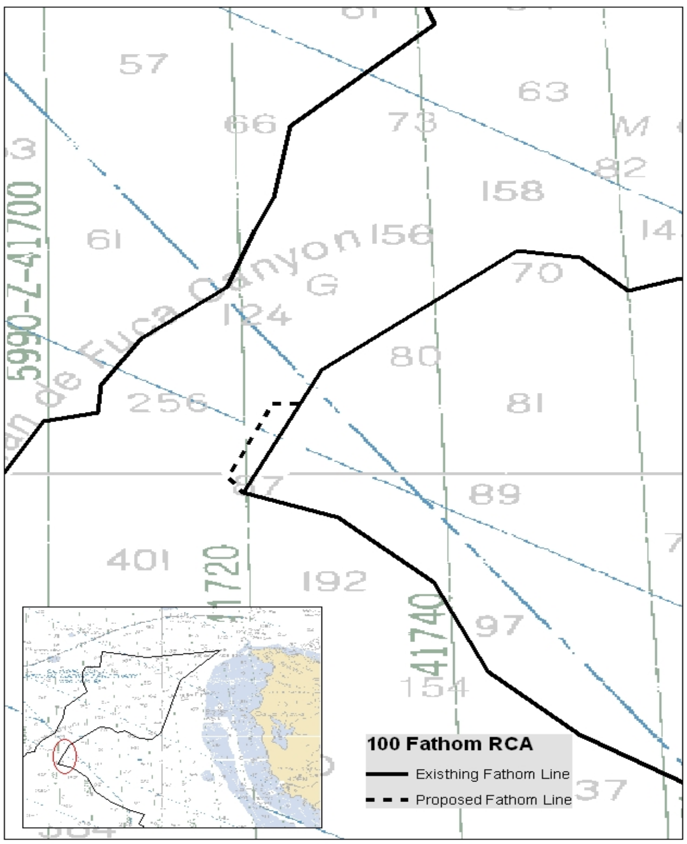


Table 5. Proposed new RCA coordinates off the North Washington coast.

Proposed 100 fathom RCA line coordinates
48° 02.35 125° 17.30 48° 02.35 125° 18.07 48° 00.00 125° 19.30 47° 59.50 125° 18.88

Gear Switching and Differential Management Measures for Fixed Gears in the Limited Entry Fishery

The GMT considered the possibility of differential management measures in the limited entry fixed gear fishery by vessels using pots or traps versus longline gears. The basis for this consideration is the significantly lower bycatch rates of demersal rockfish such as canary and yelloweye rockfish using pot gear. Observations of fixed gears north of 40°10' N lat. in depths greater than 100 fm during 2002-06 showed that longline gears had a 0.066% discard ratio of yelloweye to retained sablefish, while pot gears had a 0.000% discard ratio (Table 4-31)[1]. Other species, such as Pacific halibut and lingcod had higher bycatch rates, but in all cases these rates were much lower than those observed using longline gear.

The GMT originally proposed the concept of gear switching due to lower rockfish bycatch rates relative to line gears. This proposal contemplated allowing longline-endorsed limited entry permit holders to switch gears from longlines to pots to take advantage of liberalized management measures (i.e., greater RCA access or higher cumulative landing limits). However, gear switching could only go one way since switching from pots to longlines would exacerbate rockfish bycatch concerns.

This idea generated some support and some condemnation from fishermen. Some supported the measure since there could be expanded areas open to fishing that have been closed since 2003. Others condemned the proposal for fear that more pot gear on a given piece of ground would cause conflicts with other fishermen. However, if more access to the RCA was allowed, this could help mitigate gear conflicts on the grounds. Some fishermen with pot-endorsed fixed gear permits also expressed concern that their permits would lose value under this proposal if longline-endorsed permit holders could switch gears to pots. These costs may or may not outweigh the potential benefits of greater RCA access and/or higher cumulative landing limits.

[1] These observations did show a negligible observed yelloweye bycatch using pot gears of 7 lbs. of yelloweye for 1,548,261 lbs of retained sablefish, which compares to 1,741 lbs of yelloweye for 2,643,162 lbs of retained sablefish using longline gear (Table 4-28).

The GMT consulted with Enforcement Consultants to understand potential enforcement concerns with liberalizing the non-trawl RCA. Their initial input was this might be enforceable under the following conditions:

- fishermen should declare which gear they intend to fish before each trip,
- only one type of gear can be on board on any trip,
- no mixed strategy can be done on a trip (i.e., a fisherman cannot work a different gear previously set on a trip that is different than the declared gear for that trip),
- RCA boundaries should be specific management lines defined by coordinates in regulations, and
- if the two different gear types are deployed in a two-month cumulative limit period, then the lower cumulative limit should be specified for the entire period.

Another potential liberalization is higher cumulative landing limits for fishermen deploying pot gear. Lingcod are a valuable target species, are readily caught in pots, and currently under-utilized due to rockfish bycatch concerns. Higher limits could be considered for lingcod using pots given the low rockfish bycatch.

The GMT is recommending further exploration of these issues in the 2009-10 specifications and management measures EIS this year with the hope that gear switching and differential management measures by gear type can be used routinely as an inseason adjustment.

Open Access Nearshore

Under Council direction, the GMT examined the range of options available to keep the open access nearshore fishery within the 0.5 mt under the 2005 sharing (Table 4). The GMT examined a variety of management measures to reduce yelloweye impacts from status quo (1.3 mt) to 0.5 mt, which are summarized in Table 6.

Depth restrictions

Depth restrictions were examined in two areas: north of 34°27’ N lat. and north of 40°10’ N lat. only. The projected yelloweye impacts under a depth restriction north of 34°27’ N lat., are 0.54 mt; whereas the impacts under the same depth restriction north of 40°10’ N lat. only are 0.59 mt. Implementing depth restrictions can provide yelloweye savings from status quo of between 0.71 and 0.76 mt. The GMT believes that depth restrictions south of 40°10’ N lat. would not be necessary since they result in minimal yelloweye savings.

Trip limit reductions

If the Council chose to maintain status quo depth restrictions (30 fm north and south of 40°10’ N lat.) a 60% reduction in landed catch would be necessary north of 34° 27’ N lat. Resulting yelloweye impacts under this option are 0.52 mt. It is the GMT’s understanding that the industry would prefer a depth restriction as the primary mechanism to reduce yelloweye impacts to preserving fishing opportunities.

Depth restrictions and trip limit reductions

Under a goal to reduce yelloweye take in the nearshore fishery to 0.5 mt, a depth restriction only north of 40°10’ N lat would exceed the amount available to this fishery. An additional 20% reduction of catch north of 40°10’ N lat would be necessary to reduce yelloweye impacts to 0.49 mt.

Accessing 2008 Black Rockfish OY
The allowable take of black rockfish in 2009-2010 is increasing based on the 2007 stock assessment. To access the total available black rockfish OY, an estimated 0.8 mt of yelloweye rockfish will be caught assuming the fishery is restricted shoreward of 20 fm between 40°10' N lat and Cape Blanco.

Differential RCAs north of 40°10' N lat. (Oregon Request)
The GMT received a request to examine a 20 fm RCA between 40°10' N lat. and Cape Blanco (43° N lat.) and a 30 fm RCA north of 43° N lat. Since WCGOP observer data indicate 96.2% of the yelloweye impacts occur in the area between 40°10' N lat. and 43° N lat. (Table 7), the GMT believe that a more liberal RCA might be accommodated north of 43° N lat. without resulting in increased yelloweye impacts. However, it is noted that there is sparse data to project impacts north of 43° N lat.

Canary Impacts
Following Council direction, the GMT also examined the impacts to canary rockfish in the directed Open Access fishery under the 2005 catch sharing scenario (2.2 mt) up to a maximum of 5.8 mt. Under status quo management, canary impacts are 3.0 mt; additional canary impacts could be accommodated by taking unused harvest from other sectors. The GMT notes that there is residual canary yield due to virtually all line fisheries being constrained by estimated yelloweye impacts.

Table 6. Impacts associated with Open Access nearshore fisheries north and south of 40 10.

	No Action (30 fm RCA boundary)	**20 fm depth restriction (north of 34°27' N lat.)**	**20 fm depth restriction (north of 40°10' N lat.)**	**20 fm depth restriction, 40°10' - 43° N lat.)**	**20 fm depth restriction & 20% reduction in landed catch**	**Reductions to landed catch only (60%)**	**20 fm depth restriction (north of 40°10' N lat.) with maximum black rockfish opportunity coastwide**
SOUTH							
Shallow nearshore species	55	55	55	55	55	22	55
Black Rockfish	4	4	4	4	4	2	**24**
Blue Rockfish	7	7	7	7	7	3	7
Other deeper nearshore species	30	30	30	30	30	12	30
Cabezon	22	22	22	22	22	9	22
Kelp Greenling	1	1	1	1	1	1	1
Lingcod	19	19	19	19	19	8	19
California Sheephead	31	31	31	31	31	12	31
NORTH							
Black Rockfish	162	162	162	162	130	65	**275**
Blue Rockfish	13	13	13	13	10	5	13
Other minor nearshore rockfish	17	17	17	17	14	7	17
Cabezon	21	21	21	21	17	8	21
Kelp Greenling	17	17	17	17	14	7	17
Lingcod	60	60	60	60	48	24	60
Canary	**3.04**	**2.22**	**2.66**	**2.66**	**2.38**	**1.22**	**3.25**
Bocaccio	0.02	0.01	0.02	0.02	0.02	0.01	0.02
Widow	0.05	0.04	0.04	0.04	0.03	0.02	0.05
Yelloweye	**1.30**	**0.54**	**0.59**	**0.59**	**0.49**	**0.52**	**0.78**

Table 7. Overview of observed sets of bycatch of yelloweye rockfish in commercial nearshore fisheries during the period January 2003 to April 2007 by area.

	Number of "sets"				**Yelloweye Catch**			
			with yelloweye					
Area	all observed	% of coastwide	number	% of area	lb	% of coastwide	rate per retained target	area % by 3 highest vessels
Columbia River, OR - Cascade Head, OR (44.9°)	197	12.1%	5	3%	18	1.7%	0.1%	86%
Cascade Head, OR (44.9°) - Cape Blanco, OR (43°)	17	1.0%						
Cape Blanco, OR (43°) - OR/CA Border (42°)	558	34.2%	34	6%	**423**	**40.3%**	0.6%	50%
OR/CA Border (42°) - N/S Management Line (40.16°)	347	21.2%	48	14%	**587**	**55.9%**	0.7%	80%
N/S Management Line (40.16°) - Pt. Arena (38.95°)	62	3.8%	1	2%	10	0.9%	0.3%	100%
Pt. Arena (38.95°) - Pt. San Pedro (37.6°)	61	3.7%	4	7%	12	1.1%	0.2%	100%
Pt. San Pedro (37.6°) - Pt. Lopez (36°)	53	3.2%					0.0%	100%
Pt. Lopez (36°) - Pt. Conception (34°38)	338	20.7%					0.0%	
North of Pt. Conception (34°38)	1,633		351	21%	1,049		0.49%	52%

Conception Area Sablefish Daily Trip Limit (DTL)
The GMT discussed increases to the Conception Area limited entry and open access sablefish daily trip limits to accommodate the higher OYs under the Council preferred alternative (2009 - 1,379 mt; 2010 - 1,258 mt). For the limited entry fixed gear fishery, the GMT recommends the following limit: 400 lb per day, one landing per week up to 1,500 lb. For the open access fishery, the GMT recommends the following limit: 400 lb per day, one landing per week up to 1,500 lb, and 8,000 lb per 2 months. Although participation varies in the open access fishery, the GMT feels that the bi-monthly limit will limit effort shifts anticipated under this higher OY. If landings are tracking high, the Council can reduce trip limits through the inseason process.

Fixed Gear Logbooks
The GMT recommended in April that the Council include mandatory logbooks for the limited entry fixed gear fleet in 2009-2010 management measures (Agenda Item H.5.b, Supplemental GMT Report, April 2008), and reiterates that recommendation here. With adequate logbook data, the GMT could incorporate seasonal patterns in catch and effort into the limited entry fixed gear bycatch model, something the model cannot do now.

Limited Entry Non-Whiting Trawl
Based on the Council's preferred OYs adopted under agenda item F.4, the GMT analyzed trip limits and RCAs for the trawl fishery. These trip limits and RCAs were designed to maximize fishing opportunity given the available OYs for constraining overfished species and target species. In the north, yelloweye rockfish is the primary constraining species to trawl activities shoreward of the trawl RCA and darkblotched rockfish is the constraining stock to opportunities seaward of the trawl RCA. In the south, cowcod is the primary constraining species. In addition, several target species OYs are attained under proposed opportunities, leading to a de-facto constraint on other target species. Petrale sole in particular is one target species that is fully attained under proposed trip limits and RCA boundaries and this leads to a constraint on DTS species and shelf flatfish.

Industry members in the north have reported that market gluts occur during the period 1 fishery. As crabbers transition out of the crab fishery in February and try to capitalize on period 1 opportunities before the end of the period, a pulse of petrale sole and Dover sole can occur. The pulse associated with crab vessels transitioning to trawl activity is often exacerbated by poor weather that limits fishing opportunity to a few select days in period 1. Several industry members have reported that this pulse adversely impacts the market and can result in lower exvessel prices. In order to spread out the amount of petrale sole caught during the first period of the year, the attached proposal extends the time period when petrale areas are in effect. Specifically, petrale sole areas in the north are in effect from January through March. Trip limits on petrale sole are set lower in the January – February time period than would otherwise be the case, but it is expected that more will occur in March, thus spreading out the amount of petrale sole landed in the first several months of the year.

The following tables illustrate the GMT's proposed option for Limited Entry Non-Whiting trawl fisheries in 2009 and 2010 and the associated rebuilding and target species impacts.

		RCA Boundaries									
Subarea	Period	Inline	Outline	Sable	Longsp	Shortsp	Dover	Otr Flat	Petrale	Arrowt'th	Slope Rk
North of 40	Jan-Feb	75	200*	18,000	22,000	17,000	110,000	110,000	25,000	150,000	1,500
10 Large Footrope	Mar Apr	75 75	200* 200	18,000	22,000	17,000	110,000	110,000	25,000	150,000	1,500
	May-Jun	75	See	22,000	22,000	17,000	90,000	110,000	30,000	150,000	1,500
	Jul-Aug	75	Footnote	22,000	22,000	17,000	90,000	110,000	30,000	150,000	1,500
	Sept-Oct	75	200	22,000	22,000	17,000	90,000	110,000	30,000	150,000	1,500
	Nov-Dec	75	200*	18,000	22,000	17,000	110,000	110,000	40,000	150,000	1,500
North SFFT	Jan-Feb	75	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	1,500
	Mar Apr	75 75	200* 200	7,500	5,000	3,000	45,000	90,000	18,000	90,000	1,500
	May-Jun	75	See	7,500	5,000	3,000	45,000	90,000	18,000	90,000	1,500
	Jul-Aug	75	Footnote	7,500	5,000	3,000	45,000	90,000	18,000	90,000	1,500
	Sept-Oct	75	200	7,500	5,000	3,000	45,000	90,000	18,000	90,000	1,500
	Nov-Dec	75	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	1,500
38 - 40 10	1	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	15,000
	2	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	15,000
	3	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	15,000
	4	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	10,000
	5	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	10,000
	6	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	15,000
S 38	1	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	55,000
	2	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	55,000
	3	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	55,000
	4	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	55,000
	5	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	55,000
	6	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	55,000

note: Splitnose equal to slope rockfish limits
Chilipepper limits set at 5,000 lbs per two months in the south
Seaward RCA boundaries set at 150 fathoms north and 200 fathoms south of Cape Falcon to 40 10 May - Aug
Shoreward RCA boundaries north of Cape Alava are closed
A " * " means petrale areas are in effect

		North	South	Total
	Canary	12.8	2.8	15.5
Rebuilding	POP	85.7	0.0	85.7
Species	Darkblotch	211.2	36.7	247.9
	Widow	1.8	6.3	8.1
	Bocaccio	-	12.3	12.3
	Yelloweye	0.6	0.0	0.6
	Cowcod	-	1.3	1.3
	Sablefish	2,442.7	614.4	3,057.2
Target	Longspine	445.9	338.7	784.6
Species	Shortspine	1,040.7	345.1	1,385.8
	Dover	10,026.4	3,012.3	13,038.7
	Arrowt'th	1,846.9	64.0	1,910.9
	Petrale	2,102.5	347.1	2,449.6
	Other Flat	1,573.7	558.5	2,132.2
	Slope Rk	81.0	205.6	286.7

The second option for the limited entry non-whiting trawl fishery holds yelloweye impacts to 0.5 metric tons. The principal tool for achieving this catch level is a 60 fathom shoreward trawl RCA boundary in the north for much of the year. By establishing a 60 fathom shoreward boundary, cumulative limits can be higher than if the RCA was held at 75 fathoms. However, a 60 fathom RCA boundary makes access to many target species, such as petrale sole in the summer months, relatively less accessible. For those species that are accessible at 60 fathoms, more effort must be exerted to attain a given catch level than if a 75 fathom RCA boundary were established.

The following tables illustrate the proposed RCA boundaries and cumulative limits if the Council wishes to hold the non-whiting trawl fishery to 0.5 metric tons of yelloweye. The main difference in this option is in the north for vessels using selective flatfish trawl gear. Sablefish for vessels using selective flatfish gear is set at 5,000 lbs for the year, and Dover sole is set at 40,000 lbs for the year.

Subarea	Period	Inline	Outline	Sable	Longsp	Shortsp	Dover	Otr Flat	Petrale	Arrowt'th	Slope Rk
	1	60	200*	18,000	22,000	17,000	110,000	110,000	40,000	150,000	1,500
North of 40	2	60	200	18,000	22,000	17,000	110,000	110,000	30,000	150,000	1,500
10 Large	3	60	see	22,000	22,000	17,000	110,000	110,000	30,000	150,000	1,500
Footrope	4	75	footnote	22,000	22,000	17,000	110,000	110,000	30,000	150,000	1,500
	5	75	200	22,000	22,000	17,000	110,000	110,000	30,000	150,000	1,500
	6	60	200*	18,000	22,000	17,000	110,000	110,000	40,000	150,000	1,500
North SFFT	1	60	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	1,500
	2	60	200	5,000	5,000	3,000	40,000	90,000	18,000	90,000	1,500
	3	60	see	5,000	5,000	3,000	40,000	90,000	18,000	90,000	1,500
	4	75	footnote	5,000	5,000	3,000	40,000	90,000	18,000	90,000	1,500
	5	75	200	5,000	5,000	3,000	40,000	90,000	18,000	90,000	1,500
	6	60	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	1,500
38 - 40 10	1	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	15,000
	2	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	15,000
	3	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	15,000
	4	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	10,000
	5	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	10,000
	6	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	15,000
S 38	1	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	40,000
	2	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	40,000
	3	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	40,000
	4	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	40,000
	5	100	150	20,000	22,000	17,000	110,000	110,000	30,000	10,000	40,000
	6	100	150	20,000	22,000	17,000	110,000	110,000	50,000	10,000	40,000

note: Splitnose equal to slope rockfish limits
Chilipepper limits set at 5,000 lbs per two months in the south
Seaward RCA boundaries set at 150 fathoms north and 200 fathoms south of Cape Falcon to 40 10
Shoreward RCA boundaries north of Cape Alava are closed

		North	South	Total
Rebuilding Species	Canary	8.9	2.8	11.7
	POP	94.8	0.0	94.8
	Darkblotch	209.9	36.7	246.6
	Widow	1.9	6.3	8.2
	Bocaccio	0.0	12.3	12.3
	Yelloweye	0.5	0.0	0.5
	Cowcod	0.0	1.3	1.3
Target Species	Sablefish	2389.6	614.4	3004.0
	Longspine	446.4	338.7	785.1
	Shortspine	1053.6	345.1	1398.7
	Dover	10657.2	3012.3	13669.5
	Arrowt'th	1674.6	64.0	1738.6
	Petrale	1924.2	347.1	2271.3
	Otr Flat	1518.8	558.5	2077.3
	Slope Rock	86.6	205.6	292.2

One Bottom Trawl Gear on Board North of 40 10' N Latitude

The GMT has discussed the concept of only allowing a single bottom trawl gear on board as outlined in Chapter 4, Section 4.5.2.1 of the DEIS. In recent discussions, the GMT identified several issues that would need to be addressed before putting this type of regulation in place. Thus the GMT recommends dropping this issue from the analysis for this biennium.

Limited Entry Whiting Trawl

Sector-Specific Bycatch Limits

The analysis of sector-specific bycatch caps in the limited entry whiting trawl fishery begins on p. 134 of Agenda Item F.4, Supplemental Attachment 2. If the Council chooses to establish sector specific bycatch limits there are three related decisions needed.

First, the Council must choose to assign caps to the sector. Two options for doing so include: (1) pro-rata distributions based on each sector's whiting allocation; or, (2) distributions based on the bycatch model. Table 8 compares the two methods assuming the 2005 catch sharing scenario for canary, a 25 mt cap for darkblotched, and a widow cap that would leave all other sectors unaffected.

Table 8. Potential Sector Specific Bycatch Limits—Bycatch Model vs. Pro Rata Distribution

BYCATCH MODEL APPROACH APPLIED TO PREFERRED OY			
	Canary	Darkblotched	Widow
CP	1.2	10.0	157.5
MOTHERSHIP	9.6	10.2	128.7
SHORESIDE	7.3	4.8	163.8
PRO RATA DISTRIBUTION APPROACH APPLIED TO PREFERRED OY			
	Canary	Darkblotched	Widow
CP	6.1	8.5	153.0
MOTHERSHIP	4.3	6.0	108.0
SHORESIDE	7.6	10.5	189.0

Neither method seems optimal. For example, under the bycatch model approach, the CP sector would have already exceeded its canary cap this season. On the other hand, the pro rata approach would give the highest darkblotched limit to the shoreside sector even though that sector fishes shallower than the at-sea sectors. It would likely take a mixing of the two methods to set bycatch limits that reasonably accommodate the harvest of each sector's whiting allocation.

Second, the Council would need to decide how to handle unused bycatch limits with the two options being to: (1) rollover to other non-tribal whiting sectors on a pro-rata basis (based on initial whiting allocations); or, (2) be placed back into the scorecard for use by all sectors.

Third, the Council would need to decide whether rollovers of bycatch could occur prior to a sector harvesting its full allocation of whiting. If so, some process for transferring bycatch—like the current whiting reapportionment rule—would be needed. The GMT discussed scenarios where a sector might wish to release its unused bycatch prior to taking its whiting allocation, either because it was unlikely to need the bycatch or because it did not plan on taking its full allocation. To prevent this from happening might unduly restrict the flexibility of the fleet.

Sector specific limits reduce the probability of one sector affecting another and provide some assurance that bycatch will be available during the season the sector prefers to fish. On the other hand, sector specific limits for some species, if small enough, could conceivably limit flexibility and constrain sectors more than with status quo management because of the smaller risk pool.

Catcher Vessel Monitoring

The GMT identified two circumstances where current whiting trawl fisheries are unmonitored or insufficiently monitored in the RCA. Catcher vessels delivering to motherships do not currently have a monitoring requirement to ensure maximized retention of catch and those vessels that elect to sort their catch while participating in the shoreside whiting fishery are not required to have 100% monitoring. Both issues are a concern to the GMT and the Council requested analysis of these two issues in April when 2009-10 management measure alternatives were adopted for analysis.

Catcher vessels delivering to motherships are currently unmonitored although they are subject to maximized retention. If catch is not fully retained by catcher vessels in the RCA, then lack of monitoring of these activities means that discards and total bycatch may be under-estimated. While there are two observers stationed on motherships these vessels deliver to, there is no mechanism to assure that catch is fully retained on catcher vessels in this sector, nor are any catcher vessels in this sector monitored with human observers. The GMT recommends a mandate to have electronic monitoring systems on catcher vessels delivering to motherships to ensure that catch is fully retained.

The GMT notes that the current regulations do not contain language that specifically prohibits catcher vessels in the mothership sector from dumping catch at sea, therefore a prohibition should be added to clarify the intent of the existing regulations. Regulations at § 660.306 (i)(2) currently prohibit vessels from interfering with or biasing the sampling employed by an observer by mechanically or physically sorting or discarding catch before sampling, this language was intended to include the dumping of catch at sea by catcher vessels.

A general prohibition would be added, that prohibits sorting or discarding of any portion of a codends of fish taken by a catcher vessel in the mothership sector prior to the catch being received on a mothership, and prior to the observer being provided access to the unsorted catch.

There are also some catcher vessels in the shoreside whiting fishery that sort their catch at sea and are therefore not subject to the maximized retention and 100% monitoring requirements under Amendment 10. While these vessels are subject to the West Coast Groundfish Observer Program rotation, there is approximately a 25% sample rate in observing current limited entry trawl activities. Therefore, there is high uncertainty in the amount and species composition of discards in the fishery. Since the implementation of bycatch limits in 2004, the whiting fishery has been potentially constrained by low bycatch limits for species such as canary, darkblotched, and widow rockfish. Higher uncertainty in estimating the discards in the whiting fishery risks exceeding OYs for these species. Therefore, the GMT recommends 100% observer coverage for vessels sorting their catch and discarding some or all of their bycatch while targeting whiting in the RCA. Human observers, rather than an electronic monitoring system, are recommended since understanding the species composition of discards is critical in managing this fishery.

Exception to Processing Rule

At their April meeting, the Council requested exploration of an exemption to the at-sea processing rule for whiting vessels less than 75 ft in length. This would allow for small vessels to fish under the shorebased whiting allocation while processing fish (i.e. tailing and freezing) into a value-added product.

Based on discussions with NMFS, the GMT suggests the following language at the end of 660.373 (a) to allow for this exemption:

> Notwithstanding the other provisions of 50 CFR Part 660, Subpart G, a vessel with a length overall of 75 feet or less that harvests whiting and cuts the tail off, in addition to heading and gutting, but with no additional preparation to the whiting, is not considered to be a catcher/processor nor is it considered to be processing fish. Such a vessel is considered a participant in the shore-based whiting sector, and is subject to regulations and allocations for that sector.

Recreational

The Council provided guidance on 2009-2010 recreational management measures under Agenda Item F.4. Tables 9a-9c illustrate the preferred seasonal structure proposed by the three states. Table 10 summarizes the tentative recreational harvest guidelines for yelloweye rockfish and canary rockfish.

Table 9a. Preferred season structure for the Washington recreational fishery.

Marine Area	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
3 & 4 (N. Coast)	Open all depths				Open <20 fm May 21-Sep 30 a/					Open all depths		
2 (S. Coast)	Open all depths		Open <30 fm Mar 15 - June 15 b/				Open all depths except lingcod prohibited south of 46 58 on Fri. and Sat. c/		Open all depths			
1 (Col. R.)	Open all depths				Open all depths d/					Open all depths		

a/ Groundfish retention allowed >20 fm on days when Pacific halibut is open.
b/ Retention of sablefish and Pacific cod allowed seaward of 30 fm from May 1- June 15.
c/ Retention of lingcod prohibited south of 46 58 on Fri. and Sat. from July 1 - Aug 31.
d/ Retention of groundfish, except sablefish and Pacific cod, prohibited with Pacific halibut on board.

Table 9b. Preferred season structure for the Oregon recreational fishery.

Jan	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Open all depths					Open <40 fm				Open all depths		

Table 9c. Preferred season structure for the California recreational fishery.

Management Area	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
North	**CLOSED**				Open <20 fm, May 15 - Sept 15				**CLOSED**			
North-Central N. of Pt. Arena	**CLOSED**				Open <20 fm, May 15 - Aug 15			**CLOSED**				
North-Central S. of Pt. Arena	**CLOSED**					Open <30 fm, June 13 - Oct 31					**CLOSED**	
Monterey South-Central	**CLOSED**				Open <40 fm, May 1 - Nov 15						**CLOSED**	
Morro Bay South-Central	**CLOSED**				Open <40 fm, May 1 - Nov 15						**CLOSED**	
South	**CLOSED**		Open <60 fm									

Table 10. Summary of impacts from recreational groundfish fishery alternatives.

Alternative	Canary	Yelloweye
No Action WA Rec. Alt.	1.0	2.5
WA Rec. Alt. 1	0.6	1.7
WA Rec. Alt. 2	0.7	1.8
WA Rec. Alt. 3	0.7	1.9
Pref. WA Rec. Alt.	***1.2***	***2.5***
OR Rec Alt. 1	1.7	1.6
OR Rec Alt. 2	2.0	1.8
OR Rec Alt. 3	2.2	2.0
OR Rec Alt. 4 (No Action)	2.3	2.2
OR Rec Alt. 5	2.6	2.5
Pref. OR Rec Alt. 6	***2.5***	***2.5***
No Action CA Rec. Alt.	7.8	4.1
Rev. CA Rec. Alt. 1	4.9	0.5
Rev. CA Rec. Alt. 2	6.8	1.1
Rev. CA Rec. Alt. 3	6.9	1.6
Rev. CA Rec. Alt. 4	7.0	1.7
Rev. CA Rec. Alt. 5	7.2	2.0
Pref. CA Rec. Alt.	***6.9***	***2.6***

Bronzespotted rockfish

The Council adopted a zero bag-limit for bronzespotted rockfish (*S. gilli*). In 2007, the NMFS SWFSC presented a report to the Council on conservation concerns for this species (Agenda item E.2.b, Attachment 3, March 2007). The report notes a rapid decline in commercial landings during the 1980s. Subsequent analysis showed that hook and line gear, along with the rapid growth of the Southern California gillnet fishery in the early 80s accounted for most of the mortality during the period of apparent decline. The limited amount of data from the recreational fishery suggests that most of the recreational catch comes from rare trips that catch large numbers of bronzespotted rockfish. A bag-limit of zero fish may ensure that targeting does not occur, and would encourage vessels to move when they encounter this species.

Commercial landings of bronzespotted rockfish since 2000 are estimated at less than one metric ton per year. Recreational landings are also minor and sporadic. In 2001 Cowcod Conservation Areas were put in place off of the Southern California Bight and thereafter the catch estimates from the recreational fishery have shown zero impact for all years other than 2004 when the estimated impacts were less than 100 pounds. The Cowcod Conservation areas and 60 fm RCA have placed the majority of the habitat of this species in areas in which recreational fishing is prohibited. It is unlikely that a zero-bag limit will create anything other than a negligible reduction in impacts.

SUMMARY

The GMT constructed the following table to lay out potential trade-offs of various harvest sharing scenarios to stay under the yelloweye OY adopted under F.4 (Table 11).

Table 11. Alternative yelloweye rockfish harvest-sharing scenarios

	Alt 1	Alt 2	Alt 3
LE Non-Whiting Trawl	0.3	0.6	0.5
LE Whiting Trawl	0.3	0	0.1
LE Fixed Gear	1.9	1.4	1.7
Directed OA	0.5	1.1	0.8
WA Rec	2.7	2.7	2.7
OR Rec	2.5	2.4	2.5
CA Rec	2.8	2.7	2.8
Directed Total	11	10.9	11.1
Non-EFP Set-Asides	5.8	5.8	5.8
EFP	0.2	0.3	0.1
Total OY	17	17	17

Alternative 1 represents catch sharing under 2005. Under this option, the following fisheries will be severely restricted: non-whiting trawl, open access nearshore, open access sablefish, and open access dogfish. The limited entry fixed gear fishery will not be restricted. The limited entry whiting trawl is provided yelloweye under this option, which observer data now indicates is not needed to prosecute the fishery under status quo.

Alternative 2 represents an option that shows the trade off's of restructuring the original 2005 catch sharing. Under this option, all yelloweye impacts in the limited entry trawl fishery (whiting and non-whiting) would be provided to the non-whiting trawl. A 20 fm depth restriction between 40°10' N lat and Cape Blanco would be required of the open access nearshore fishery, but additional opportunities would be provided to access the higher OY for black rockfish. The limited entry fixed gear fishery would have a change to the seaward RCA, from 100 fm to 125 fm, either north of Pt. Chehalis in Washington or between Cape Blanco and Cascade Head in Oregon. This alternative also shows the trade off of requiring EFP set-asides to be taken from the fishery for which they are proposed.

Alternative 3 represents another option for restructuring the 2005 catch sharing. Under this option, the non-whiting trawl fishery is restricted to provide additional yelloweye to the limited entry whiting fishery in the case that their OY increases to 400,000 mt or greater. A depth restriction between 40°10' N lat and Cape Blanco would be required of the open access fishery in addition to a 20% decrease in catch. The limited entry fixed gear fishery will not be restricted. This alternative also shows the trade off of reducing yelloweye impacts in the EFPs.

GMT Recommendations:

1. Adopt a black rockfish sharing framework for 2009-2010.
2. Adopt EFP set-asides.
3. Consider adopting an RCA boundary of 125 fm between Cape Blanco and Cascade Head except on days when the directed halibut fishery is open.
4. Consider adding an RCA exemption for the dogfish fishery under a 125 or 150 fm line north of Pt. Chehalis.

5. Modify the 100 fm line for the RCA off the northern Washington.
6. Consider allowing longline-endorsed limited entry permit holders to switch gears from longlines to pots.
7. Increase trip limits for the Conception Area limited entry and open access sablefish DTL.
8. Mandate logbooks for the limited entry and open access fixed gear fleets.
9. Select a suite of limited entry non-whiting trawl management measures for 2009-2010.
10. Consider sector-specific bycatch limits for the limited entry whiting fleet.
11. Adopt an electronic monitoring requirement for catcher vessels in the mothership sector.
12. Adopt a prohibition on discards by catcher vessels in the mothership sector.
13. Adopt a 100% observer requirement for shore-based whiting vessels that sort at sea.
14. Adopt a processor exemption for small vessels that tail and freeze whiting at sea.

PFMC
6/13/08

Revised Table 11. Alternative yelloweye rockfish harvest-sharing scenarios

	Alt 1	Alt 2	Alt 3
LE Non-Whiting Trawl	0.3	0.6	0.5
LE Whiting Trawl	0.3	0	0.1
LE Fixed Gear	1.9	1.4	1.7
Directed OA	0.5	1.1	0.8
WA Rec	2.7	2.7	2.7
OR Rec	2.5	**2.5**	2.5
CA Rec	2.8	**2.8**	2.8
Directed Total	11	11.1	11.1
Set-Asides (including EFPs)	**5.7**	**5.7**	**5.7**
Total OY	**16.7**	**16.8**	**16.8**