AMENDMENT 17

TO THE PACIFIC COAST GROUNDFISH FISHERY MANAGEMENT PLAN (MULTI-YEAR MANAGEMENT AND THE SPECIFICATIONS AND MANAGEMENT MEASURES PROCESS)

INCLUDING ENVIRONMENTAL ASSESSMENT, REGULATORY IMPACT REVIEW, AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

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Abstract: This Environmental Assessment analyzes the effects of converting the Pacific Fishery Management Council's current annual specifications and management measures process to a biennial management process. The federal action consists of specifying that the West Coast groundfish harvest specifications and management measures process will be conducted on a biennial basis. Three notices will be published in the *Federal Register* to make this rulemaking final, including a Notice of Availability for the Fishery Management Plan amendment, a Proposed Rule, and a Final Rule. Environmental effects considered within this document are to: target and non-target species, the age of the resource surveys and assessments used in setting harvest specifications, harvest availability and processing opportunity, safety of fishery participants, social and cultural needs of fishery participants, and public participation in and management and science time devoted to the specifications and management process. The preferred alternative is to have the Pacific Fishery Management Council meetings develop the specifications and management measures at three meetings held in the November, April, and June meetings prior to the start of the biennial fishing period. The biennial fishing period will start on January 1, with the first biennial fishing period being from January 1, 2005 through December 31, 2006.

TABLE OF CONTENTS

1.0 PURPOSE AND NEED FOR ACTION

1.1 How this Document is Organized

This document is an Environmental Assessment and Regulatory Impact Review (EA/RIR) for Amendment 17 to the Pacific Coast Groundfish Fishery management Plan (FMP.) Amendment 17 primarily addresses the Council process of setting groundfish specifications and management measures and revisions to that process.

- Chapter 1 provides the "Purpose and Need" for the Council's action and is intended to provide the public with an explanation of why the Council is considering an FMP amendment.
- Chapter 2 describes the alternatives that the Council has considered for revising the groundfish specifications and management measures process.
- Chapter 3 describes the physical, biological, and socio-economic environment of the groundfish species and groundfish fisheries that could be affected by Amendment 17.
- Chapter 4 is an analysis of the potential effects of the alternatives considered in Amendment 17 on the human environment.
- Chapter 5 addresses the consistency of Amendment 17 alternatives with the FMP and other applicable law.
- Chapter 6 contains the Regulatory Impact Review.
- Chapter 7 provides a bibliographic reference for this document and lists the documents preparers.
- Appendix A excerpts the portions of the FMP that would be amended by this action and provides alternative amendatory language.
- Appendix B shows sample timelines for making the transition from the status quo annual management process to alternative biennial management processes.

1.2 Purpose and Need

The FMP provides guidance for the Council's groundfish fishery management policies. This FMP covers over 80 species of groundfish (listed in Section 3.0 of the FMP) taken in multi-user fisheries occurring within the Exclusive Economic Zone (EEZ, 3-200 nautical miles offshore) off the coasts of Washington, Oregon, and California. Many of the FMP's guiding policies have been implemented through long-term federal regulations at 50 CFR 660.301-.360. These regulations cover issues ranging from allocations of particular species between different user groups to gear marking requirements to licensing and observer requirements.

In addition to deliberating on long-term groundfish fishery regulations, the Council sets groundfish harvest levels through an annual regulatory process. This annual process establishes harvest "specifications", which are harvest levels or limits such as Acceptable Biological Catches (ABCs,) optimum yields (OYs,) or allocations for different user groups. Management measures, such as trip limits, closed times and areas, and gear restrictions are also set in the annual regulatory process. Management measures are partnered with the specifications in the annual process because these measures are specifically designed to allow the fisheries to achieve, but not to exceed, the specifications harvest levels.

Annual development of specifications and management measures, with regulatory review and implementation by NMFS, is authorized in Section 5.6 of the FMP. Under this section of the FMP, certain management measures have been designated as routine for many of the groundfish species managed under the FMP. The Council annually publishes a list of those management measures designated as routine in its Stock Assessment and Fishery Evaluation (SAFE) Report.

Reconsidering the process by which new management measures are designated as routine is not part of the purpose of the actions analyzed in this document. Instead, the actions analyzed in this document will focus on the larger framework for developing and implementing specifications and management measures.

Since 1990, the Council has annually developed its recommendations for specifications and management measures in a two-meeting process (usually its September and November meetings) followed by a NMFS final action published in the Federal Register and made available for public comment and correction after the effective date of the action. In 2001, NMFS was challenged on this process in Natural Resources Defense Council, Inc. v. Evans, 2001 168 F.Supp. 2d 1149 (N.D. Cal. 2001) and the court ordered NMFS to provide prior public notice and allow public comment on the annual specifications. Because of this court order, the Council needs to amend the FMP's framework for developing annual specifications and management measures to incorporate NMFS publication of a proposed rule for the specifications and management measures, followed by a public comment period and a final rule.

In addition to needing to revise the notice and comment procedure associated with the specifications and management measures, the Council wished to take a new look at efficiency in the annual management process. Groundfish management workload levels have grown in recent years, particularly those associated with setting annual harvest levels for both depleted and healthy stocks. Because of the increasing workload associated with developing specifications and management measures, the Council and NMFS have had less time for addressing many other important groundfish fishery management issues. NMFS has recently asked all of the fishery management councils to consider how they might streamline their processes for developing regulatory recommendations. To meet this NMFS request, the Council has decided that it needs to consider whether specifications and management measures could be published for multi-year, rather than single year, periods.

The Council's purposes in and needs for considering the actions analyzed in this document are to:

- Comply with a court order to provide more opportunity for public comment in the NMFS rule publication process;

- Streamline the process of and reduce the workload associated with developing specifications and management measures so that more Council and NMFS time may be devoted to issues other than specifications and management measures development.

1.3 Public Participation

The court's order in Natural Resources Defense Council, Inc. v. Evans, 2001 168 F.Supp. 2d 1149 (N.D.Cal. 2001) required that NMFS provide prior public notice and comment on the annual specifications. NMFS also began discussions about streamlining regulatory development and implementation processes with all of the fishery management councils in summer 2001. Because several NMFS Regions and councils use annual specifications and management measures development processes, the efficiency of those processes was an important part of the regulatory streamlining discussions. One suggestion to come out of those discussions was that some councils might consider whether their specifications and management measures could be developed for multi-year periods.

At its November 2001 meeting, the Council discussed the need to incorporate a NMFS public notice and comment period into the specifications and management measures process before implementation of the final rule. The Council decided that it could combine its investigations into how to modify the notice and comment period and into the applicability of multi-year management to groundfish fishery management. To initially scope out these issues, the Council created the Ad-Hoc Groundfish Multi-Year Management Committee (hereinafter, "Committee.") The Committee included representatives from the fishing industry, the conservation community, the three states and NMFS.

The Committee held public meetings in Portland, OR over December 13-14, 2001, and over January 31 - February 1, 2002. During those meetings, the Committee discussed the many issues associated with changing the specifications and management measures notice and comment process and with the possibility of making a transition to multi-year management (detailed in Section 3.3.1 of this document.) In its meetings, the Committee developed a suite of options to address the issues discussed in the Purpose

and Need section of this document, above. In March 2002, the Council made these options available for more broad public comment. The public provided comment to the Council at its April 2002 and subsequent meetings. At its April 2002 meeting, the Council chose five alternatives for analysis based in part on the comments of the public and its advisory bodies. A draft analysis of alternative specifications and management measures processes was available for public consideration at the June 2002 Council meeting. These alternatives are presented in Section 2.0 of this document. Based on public comment the Council received in June, the Council requested an additional analysis of whether and how multi-year management options would make use of multi-year optimum yields (OYs). The Council briefly reviewed this additional analysis at its September 2002 meeting, then provided a final opportunity for public comment and made its final decision at its November 2002 meeting.

1.4 Decision to be Made

If NOAA approves this action, Amendment 17 would modify the FMP to set the Council's development process for the groundfish harvest specifications and management measures as a biennial process, using three meetings for that development. Amendment 17 would confirm that January 1 would remain the start date of each fishing year or two-year fishing period. Amendment 17 would also provide that, in general, the Council would develop biennial groundfish specifications and management measures at sequential November, April, and June meetings. The Council's recommendations for groundfish specifications and management measures would be finalized at the June Council meeting prior to the biennium to which they would apply, allowing adequate time for implementation through a notice and comment rulemaking.. Further, Amendment 17 would specify that, through the biennial specifications process, harvest specifications would be set for two subsequent years, with one-year OYs for each species or species group. The management measure established during the biennial process would still be adjusted as is done now, during the fishing season, to allow the fishery to achieve, but not exceed, the annual OY. Because of the unique life cycle of Pacific whiting, and because whiting management negotiations are ongoing with Canada at the time of this FMP amendment, the Council has recommended that Amendment 17 allow whiting to be managed on a separate, annual basis, if necessary. In addition to these basic revisions to the specifications and management measures process, the Council and NMFS may develop an additional process for reviewing and possibly revising, in limited circumstances, harvest levels mid-way through the two-year management cycle to ensure that they are adequately conservative to protect overfished species.

This action is an amendment to an FMP; NOAA review and approval, partial approval, or disapproval of FMP amendments is governed by Magnuson-Stevens Act processes. Under the Magnuson-Stevens Act at Section 304, NOAA Fisheries must publish an FMP amendment Notice of Availability in the *Federal Register* upon receipt of that amendment from a fishery management council. The public is given 60 days to review the FMP amendment, after which NOAA (acting on behalf of the Secretary of Commerce) has 30 days to determine whether to approve, partially approve, or disapprove the FMP amendment. If NOAA fails to make a determination on the amendment, it is automatically approved after the 30-day review period. NOAA approval of Amendment 17 and the multi-year management program that would be implemented by this amendment will be based upon whether Amendment 17 complies with the Magnuson-Stevens Act and other applicable laws.

1.5 Related NEPA Analyses

This section describes NEPA documents that have analyzed or will analyze actions related to those analyzed within this EA. These NEPA documents provide further information on and analysis of actions relating to West Coast groundfish management.

1.5.1 Environmental Impact Statement (EIS) for Proposed Groundfish Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2003 Pacific Coast Groundfish Fishery. (January 2003)

This EIS for the 2003 specifications and management measures provides an analysis of the effects of implementing the complete package of management measures for 2003. The EIS provides an example of the type of NEPA analysis needed in developing annual specifications and management measurers. The Council's annual SAFE document serves as an appendix to this EIS, with information on the history of the fishery's management, stock status for recently assessed species, economic analyses, and other information.

1.5.2 EIS on Overfished Species Rebuilding Plans. (In development.)

The Council is preparing an EIS for what will become Amendment 16 to the FMP, which will set overall guidelines for the contents of overfished species rebuilding plans and which will incorporate rebuilding plans for several species in the FMP. The Amendment 16 EIS is scheduled for concurrent consideration with the specifications and management measures issues discussed in this EA. During discussions on each of these issues, the Council will need to ensure that processes analyzed herein for developing specifications and management measures are compatible with processes for developing and implementing overfished species rebuilding plans.

1.5.3 Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) for Proposed Groundfish Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2002 Pacific Coast Groundfish Fishery. December 2001.

This EA/RIR/IRFA was prepared for the 2002 specifications and management measures and provides an example of the type of NEPA analysis used for developing the annual specifications and management measures. Similar to the 2003 EIS, the Council's SAFE document served as an appendix to this EA/RIR/IRFA. This EA/RIR/IRFA was intended to address the effects of the 2002 specifications and management measures on the environment, not the effects of the rulemaking development process on the environment.

1.5.4 EA/RIR for Amendment 13 to the Pacific Coast Groundfish FMP. December 2000.

Among other issues, Amendment 13 provided new flexibility in setting annual management measures, so that those measures could better address the rebuilding needs of overfished species. This NEPA analysis addressed the process by which new management measures are designated as routine. These routine management measures are the management measures developed in the annual specifications process. As mentioned above, the process by which new management measures are designated as routine is not part of the purpose of the Council's current discussions. Nonetheless, the Amendment 13 NEPA analysis may provide relevant additional background on the annual process of developing specifications and management measures.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Development of the Alternatives and How the Alternatives are Structured

As discussed above in Section 1.3, the alternatives for revising the specifications and management measures development process were initially discussed in December 2001 and January/February 2002 meetings of the Groundfish Multi-Year Management Committee. The Committee developed six alternatives intended to represent a reasonable range of alternative management regimes for addressing the issues discussed under Section 1.0, Purpose and Need. At its April 2002 meeting, the Council eliminated one alternative from consideration and made the five remaining alternatives available for public review. That eliminated alternative and other alternatives not considered in this document are briefly detailed in Section 2.3 of this document. At its June 2002 meeting, the Council asked for an analysis of a secondary issue relevant to each of the multi-year management alternatives – whether and how multi-year management options would make use of multi-year OYs.

2.2 Issue 1 – Process Alternatives

Each of the five following process alternatives provides the following components:

- Either an annual or biennial framework for setting specifications and management measures.
- The number of Council meetings used in developing specifications and management measures and the months in which those meetings would be held.
- The start date of the fishing year.
- A schedule for conducting new and updated groundfish stock assessments.

Table 2.2.1 Summary of Process Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Annual or Biennial	Annual	Biennial	Biennial	Biennial	Biennial
Council Meetings	September November	April June September	November March/April June	June September November	June September
Fishing Year Start Date	January1	March 1	January 1	May 1	March 1
Stock Assessments	one-third assessed each year	Two-year science schedule: one year to develop and refine models, second year to update all assessments and add new assessments.			

Process Alternative 1 (No Action)

The theme of Process Alternative 1 is to continue with the current annual management cycle, giving priority to the specifications and management measures process over other Council activities.

- Specifications and management measures set annually for a one-year period.
- Two Council meetings, with proposed specifications and management available at Meeting 1 and Council final action at Meeting 2.

  **This two-meeting process (usually September and November meetings) was standard for the 1990-2001 specifications and management measures. For the 2002 specifications, the Council adopted a three-meeting process, with proposed specifications available in June, proposed management measures available in September, and final Council action on all items in November. For 2003, the Council has had to revert to a two-meeting process (June, September) to allow a public notice and comment period prior to an expected March 1, 2003 finalization. For the purposes of this analysis, the two-meeting process will be considered the No Action alternative. **
- January 1 fishing year start date.
- Stock assessments for each assessed species are conducted once every three years. In other words, one-third of all assessed stocks receive assessment updates each year

Table 2.2.2 Alternative 1, status quo/no action

1st third of all assessed stocks			2nd third of all assessed stocks			3rd third of all assessed stocks		
Survey	*Assessed*	*Harvest*	*Survey*	*Assessed*	*Harvest*	*Survey*	*Assessed*	*Harvest*
Year 1	Year 2	Year 3						
Year 1	Year 2	Year 4	Years 1-2	Year 3	Year 4			
Year 1	Year 2	Year 5	Years 1-2	Year 3	Year 5	Years 1-3	Year 4	Year 5
Years 2-4	Year 5	Year 6	Years 1-2	Year 3	Year 6	Years 1-3	Year 4	Year 6
Years 2-4	Year 5	Year 7	Years 2-5	Year 6	Year 7	Years 1-3	Year 4	Year 7
Years 2-4	Year 5	Year 8	Years 2-5	Year 6	Year 8	Years 4-6	Year 7	Year 8
Years 5-7	Year 8	Year 9	Years 2-5	Year 6	Year 9	Years 4-6	Year 7	Year 9

Process Alternative 2 (biennial, three-meeting, March 1 start)

The theme of Process Alternative 2 is to maximize time for stock assessment scientists, Council staff, and NMFS staff to prepare documentation needed to implement specifications and management measures. Additionally, biennial management is intended to allow the Council time to focus its work in alternate years on issues other than specifications and management measures.

- Specifications and management measures set biennially for a two-year period.
- Three Council meetings, with proposed specifications available in April (Meeting 1,) proposed management measures available in June (Meeting 2,) and Council final action in September (Meeting 3.)
- March 1 fishing year start date.
- Stock assessments for each assessed species are conducted every other year.

Table 2.2.3 Alternative 2

Years in which stock surveys are conducted	Year All Stocks Assessed	Years harvest limits are based on that assessment
Year 1	Years 2-3	Years 4-5
Year 2	Years 4-5	Years 6-7
Year 3	Years 4-5	Years 6-7
Year 4	Years 6-7	Years 8-9
Year 5	Years 6-7	Years 8-9

Process Alternative 3 (biennial, three-meeting, January 1 start), Council preferred

The theme of Process Alternative 3 is to maximize time for stock assessment scientists, Council staff, and NMFS staff to prepare documentation needed to implement specifications and management measures ***without disrupting historic January 1 season start date.*** *Additionally, biennial management is intended to allow the Council time to focus its work in alternate years on issues other than specifications and management measures.*

- Specifications and management measures set biennially for a two-year period.
- Three Council meetings, with proposed specifications available in November (Meeting 1,) proposed management measures available in March/April (Meeting 2,) and Council final action in June (Meeting 3.)
- January 1 fishing year start date.
- Stock assessments for each assessed species are conducted every other year.

Table 2.2.4 Alternative 3

Years in which stock surveys are conducted	Year All Stocks Assessed	Years harvest limits are based on that assessment
Year 1	Year 2	Years 4-5
Year 2	Year 4	Years 6-7
Year 3	Year 4	Years 6-7
Year 4	Year 6	Years 8-9
Year 5	Year 6	Years 8-9

Process Alternative 4 (biennial, three-meeting, May 1 start)

The theme of Process Alternative 4 is to minimize the time between stock surveys and the years in which those surveys are used in setting harvest limits, ***while also maximizing time for Council staff and NMFS staff to prepare documentation*** *needed to implement specifications and management measures. Additionally, biennial management is intended to allow the Council time to focus its work in alternate years on issues other than specifications and management measures.*

- Specifications and management measures set biennially for a two-year period.
- Three Council meetings, with proposed specifications available in June (Meeting 1,) proposed management measures available in September (Meeting 2,) and Council final action in November (Meeting 3.)
- May 1 fishing year start date.
- Stock assessments for each assessed species are conducted every other year.

Table 2.2.5 Alternative 4

Years in which stock surveys are conducted	Year All Stocks Assessed	Years harvest limits are based on that assessment
Year 1	Year 2	Years 3-4
Year 2	Year 4	Years 5-6
Year 3	Year 4	Years 5-6
Year 4	Year 6	Years 7-8
Year 5	Year 6	Years 7-8

Process Alternative 5 (biennial, two-meeting, March 1 start)

The theme of Process Alternative 5 is to ***minimize the time between stock surveys and the years in which those surveys are used in setting harvest limits****. Additionally, biennial management is intended to allow the Council time to focus its work in alternate years on issues other than specifications and management measures.*

- Specifications and management measures set biennially for a two-year period.
- Two Council meetings, with proposed specifications and management measures available in June (Meeting 1) and Council final action in September (Meeting 2.)
- March 1 fishing year start date.
- Stock assessments for each assessed species are conducted every other year.

Table 2.2.6 Alternative 5

Years in which stock surveys are conducted	Year All Stocks Assessed	Years harvest limits are based on that assessment
Year 1	Year 2	Years 3-4
Year 2	Year 4	Years 5-6
Year 3	Year 4	Years 5-6
Year 4	Year 6	Years 7-8
Year 5	Year 6	Years 7-8

Table 2.2.7 Groundfish Multi-Year Management Process Alternatives – Summary of Policy Considerations (Y = Year)

Process Alternative	**Science Process** *Stock assessments occur Jan-May needed for all options. Different schedule indicated when more time available.*	**Data/Stock Assessment Use** *May not survey all stocks in all years. Y1 survey data used in Y2 assessment process.*	**Council Process** *Council process and workload more or less burdensome depending on whether 2- or 3-meeting process*	**NMFS Process** * 5 months minimum needed for proposed rule, comment period and response time*	**Industry Needs/Effects** *Where process is 2-years, discipline is needed in 1st fishing year to not push limits higher in Council process – otherwise fewer fish available for 2nd year, possible early closures
1. Status quo, 2-meeting annual process, 1/1 start. Annual process PFMC meets Sept. (proposed) and Nov. (final), Fishing Year starts Jan 1.	• 1/3 of stocks each year (labeled as groups A, B, and C in next box ➜) • STAR process for all assessed species, each year	• Year 1 survey info used in Y3 fishing for stock group A • Y1-2 survey info used in Y4 fishing for stock group B • Y1-3 survey info used in Y5 fishing for stock group C	• 7 months for Council staff and committees work on NEPA/RFA, SAFE documents • Less overall Council time for issues other than specifications	• 2 months for implementation, inadequate time • Less overall NMFS time for issues other than specifications	• Start date the same, process same, so little/no industry adjustment • Less Council/NMFS time to work on other industry issues
2. 3-meeting, biennial process, 3/1 start. PFMC meets April (proposed ABC/OY), June (final ABC/OY, proposed management), and Sept (final management) Fishing year starts March 1	• Stock assessments could occur Jan- Mar of following Y • All stocks assessed every other year with STAR or STAR-lite review • Intervening years have STAR process for models, new overfished spp.	• Year 1 survey info used in Y4-5 fishing for all stocks • Y2 survey info used in Y6-7 fishing • Y3 survey info used in Y6-7 fishing	• 11-19 months for Council staff and committees work on NEPA/RFA, SAFE documents • More time for issues other than specifications • Inseason adjustments for last 3 months made at Nov meeting. • Conflict with salmon management schedule	• 5.5 months for implementation, adequate time • More NMFS time for issues other than specifications	• Change in fishing year requires business planning changes for industry • 2-year process, possible early closures if limits not controlled • More Council/ NMFS time to work on other industry issues • Fishing based on older data than all other alternatives

Process Alternative	Science Process *Stock assessments occur Jan-May needed for all options. Different schedule indicated when more time available.*	Data/Stock Assessment Use *May not survey all stocks in all years. Y1 survey data used in Y2 assessment process.*	Council Process *Council process and workload more or less burdensome depending on whether 2- or 3-meeting process*	NMFS Process * 5 months minimum needed for proposed rule, comment period and response time*	Industry Needs/Effects *Where process is 2-years, discipline is needed in 1st fishing year to not push limits higher in Council process – otherwise fewer fish available for 2nd year, possible early closures
3. 3-meeting, biennial process, 1/1 start. PFMC meets Nov (proposed ABC/OY), March/April (final ABC/OY, proposed management), and June (final management) Fishing year starts Jan 1	• Stock assessments occur Jan-Oct • All stocks assessed every other year with STAR or STAR-lite review • Intervening years have STAR process for models, new overfished spp.	• Year 1 survey info used in Y4-5 fishing for all stocks • Y2 survey info used in Y6-7 fishing • Y3 survey info used in Y6-7 fishing	• 14 months for Council staff and committees work on NEPA/RFA, SAFE documents • More time for issues other than specifications • Conflict with salmon management schedule	• 6.5 months for implementation, adequate time • More NMFS time for issues other than specifications	• Start date the same • 2-year process, possible early closures if limits not controlled • Fishing based on older data than Alternatives 1, 4, 5 • More Council/ NMFS time to work on other industry issues
4. 3-meeting, biennial process, 5/1 start. PFMC meets June (proposed ABC/OY), Sept. (final ABC/OY, proposed management), and Nov. (final management) Fishing year starts May 1	• All stocks assessed every other year with STAR or STAR-lite review • Intervening years have STAR process for models, new overfished spp. • Database adjusting for change in fishing year	• Year 1 survey info used in Y3-4 fishing for all stocks • Y2 survey info used in Y5-6 fishing • Y3 survey info used in Y5-6 fishing	• 9 months for Council staff and committees work on NEPA/RFA, SAFE documents • More time for issues other than specifications • Inseason adjustments in Nov. and March possibly ill-timed for May 1 fishery start • Re-evaluation of whiting and fixed gear sablefish season management required	• 6 months for implementation, adequate • More NMFS time for issues other than specifications	• Change in fishing year requires business planning changes for industry • 2-year process, possible early closures if limits not controlled • 5/1 fishery start conflicts with current whiting and fixed gear sablefish seasons, tribal groundfish fishery management • More Council/ NMFS time to work on other industry issues

Process Alternative	Science Process *Stock assessments occur Jan-May needed for all options. Different schedule indicated when more time available.*	Data/Stock Assessment Use *May not survey all stocks in all years. Y1 survey data used in Y2 assessment process.*	Council Process *Council process and workload more or less burdensome depending on whether 2- or 3-meeting process*	NMFS Process * 5 months minimum needed for proposed rule, comment period and response time*	Industry Needs/Effects *Where process is 2-years, discipline is needed in 1st fishing year to not push limits higher in Council process – otherwise fewer fish available for 2nd year, possible early closures
5. 2-meeting, biennial process, 3/1 start. PFMC meets June (proposed) and Sept (final), Fishing Year starts March 1	• All stocks assessed every other year with STAR or STAR-lite • Intervening years have STAR process for models, new overfished spp. • Database adjusting for change in fishing year	• Year 1 survey info used in Y3-4 fishing for all stocks • Y2 survey info used in Y5-6 fishing • Y3 survey info used in Y5-6 fishing	• 9 months for Council staff and committees work on NEPA/RFA, SAFE documents • More time for issues other than specifications • Inseason adjustments for last 2-3 months made at Nov meeting	• 5.5 months for implementation, adequate • More NMFS time for issues other than specifications	• Change in fishing year requires business planning changes for industry • 2-year process, possible early closures if limits not controlled • More Council/ NMFS time to work on other industry issues

2.3 Issue 2 – Optimum Yield (OY) Duration Alternatives

Process Alternatives 2-5 feature biennial specifications and management measures processes. The Council has been operating with an annual specifications process (Process Alternative 1) since 1990. In that process, OYs have been set for one year periods. Within a biennial specifications and management measures process, the Council could use two one-year OYs or one two-year OY for each species or species group, or a mix of those alternatives for different species or species groups.

Optimum Yield Duration Alternative 1 (status quo/no action), Council preferred

All OYs for all species or species group would be set for one-year periods. In a biennial management process, each fishing year the Council would manage each species or species group to achieve but not exceed its one-year OY. At the beginning of each fishing year, fishing would begin on new one-year OYs, with no adjustments made for underage or overages in the prior year.

At its November 2002 meeting, the Council recommended this alternative, as refined by suggestions from the Council's Groundfish Management Team (GMT). The GMT suggested and the Council adopted for NMFS review, a biennial management process that implements two one-year OYs for all species. As part of this process, the Council would include a mid-biennium check-up on harvest levels that takes advantage of the two-year science process associated with the biennial management process as follows:

Table 2.3.1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Survey	A	B	C	D	E		
Assessment		A		A-C*		A-E	
Management			A		A-C		A-E
Fishing				A	A	A-C	A-C

* Assessments for fishing in Years 6-7 would be complete by October of Year 4. November Council meeting of Year 4 provides checkpoint for Year 5 harvest levels to ensure that those harvest levels set in earlier management process are adequately conservative to meet overfished species protection and conservation requirements.

Optimum Yield Duration Alternative 2 (two-year OYs)

All OYs for all species would be set for two-year periods. In a biennial management process, the Council would manage each species to achieve but not exceed the biennial OY for that species. At the end of the first year of the fishing cycle, any OY underage or overage from that year would carry over into the second year, affecting the amount of each species that could be taken in that second year. Under this alternative, the Council may wish to develop harvest checkpoints to articulate the percent of each species' OY that could be expected to be taken at different points during the two-year cycle. These harvest checkpoints would be based on historic fishing cycles, would integrate groundfish landings with landings of other species coastwide, and could be used to monitor progress through the two-year period to ensure that no severe underage or overages occur.

Optimum Yield Duration Alternative 3 (mix of one-year and two-year OYs)

OYs for some species would be set for one-year periods, for others OYs would be set for two-year periods. The Council could choose during the development of each new management cycle which species would be managed for one-year OYs and two-year OYs. One-year OYs would allow single year targets for some species within the biennial cycle, which might be appropriate for species that require particularly conservative management, such as overfished species.

2.4 Alternatives Eliminated from Detailed Study

During its initial meetings, the Multi-Year Management Committee discussed several variations on the options listed above:

Multi-Year Management for Periods Longer Than Two Years. Of the five process alternatives listed above, one would continue the annual management cycle and four would move the Council to biennial specifications and management measures. The Committee discussed management cycles ranging from one to five years in duration. These discussions revealed that setting the length of the management cycle would be a delicate balance between ensuring the use of the best and most recently available scientific information and allowing management process participants adequate time to discuss and absorb this scientific information and its implications for management. Under the current annual cycle, processing and review of data must occur at a fairly swift pace, using scientific personnel time and resources that might otherwise be dedicated to stock assessments and advanced modeling. Thus, the annual cycle tends to allow participating scientists to assess about one-third of all assessed stocks in any one year. As a result, each year's management cycle uses the most recently available information for one-third of assessed stocks. Discussions between the Committee and stock assessment scientists about timing of assessments and data availability led the Committee to conclude that a two-year management cycle would allow participating scientists more time to process and review data from the stock surveys and then more time to complete stock assessments for setting specifications and management measures. Three- to five- year cycles would have lengthened the scientific process further, but the longer cycles would have also resulted in managers using "older" data in setting harvest levels. The Committee determined that the benefits of a longer assessment and analysis period were outweighed by the need to use the best available scientific information in support of the management process.

Changing Council Meeting Dates. During its initial discussions, the Committee looked at different ways of addressing the scheduling needs of the scientific process (processing and reviewing data from resource surveys through to completed assessments) and the public notice and comment process (NMFS publication of proposed and final rules in the Federal Register). In addition to considering changing the duration of the management cycle, the fishing year start date, and the Council meetings at which discussion and decision occur, the Committee also looked at changing the dates of Council meetings to better incorporate the scientific process and the notice and comment process. For example, the Committee considered whether the process could be better served by moving the June Council meeting to July, or by moving the September and November meetings to early August and October. Ultimately, the Committee set aside these considerations for two logistical reasons. First, the current Council meeting schedule of five meetings per year held in March, April, June, September, and November is based on the management needs of a variety of fisheries (groundfish, salmon, coastal pelagic species, highly migratory species, halibut). Historically, the September and November meetings have been dominated by groundfish issues, thus the timing of those meetings could have been more flexible with changes to groundfish management needs. March and April meetings, however, are strictly timed with salmon season management and timing for those meetings could not be made flexible to accommodate groundfish management needs. The Committee was uncomfortable with the potential ripple effects of changing Council meeting dates on the management of species other than groundfish. Second, Council meeting dates must be set several years in advance to ensure meeting location reservations adequate for the large number of Council meeting participants. Even if the Committee had wanted to forward an alternative meeting schedule for public consideration, the Council and NMFS would not have been able to fully implement such an alternative for three to four years. The Committee felt that there were sufficient alternatives for addressing their goals in taking a new look at the management process without having to also address the complications of meeting logistics. Based on these technical and economic considerations, changing Council meeting dates was eliminated from further analysis.

3.0 AFFECTED ENVIRONMENT

This section of the document describes the existing fishery and the resources that would be affected by this action. The physical environment is discussed in Section 3.1, the biological characteristics of the groundfish stocks and non-groundfish stocks interacting with the groundfish fishery are discussed in Section 3.2, and the socio-economic environment is discussed in Section 3.3.

3.1 PHYSICAL ENVIRONMENT

California Current System. In the North Pacific Ocean, the large, clockwise-moving North Pacific Gyre circulates cold, sub-arctic surface water eastward across the North Pacific, splitting at the North American continent into the northward-moving Alaska Current and the southward-moving California Current. Along the U.S. West Coast, the surface California Current flows southward through the U.S. West Coast EEZ, the management area for the groundfish FMP. The California Current is known as an eastern boundary current, meaning that it draws ocean water along the eastern edge of an oceanic current gyre. Along the continental margin and beneath the California Current flows the northward-moving California Undercurrent. Influenced by the California Current system and coastal winds, waters off the U.S. West Coast are subject to major nutrient upwelling, particularly off Cape Mendocino (Bakun, 1996). Shoreline topographic features such as Cape Blanco, Point Conception and bathymetric features such as banks, canyons, and other submerged features, often create large-scale current patterns like eddies, jets, and squirts. Currents off Cape Blanco, for example, are known for a current "jet" that drives surface water offshore to be replaced by upwelling sub-surface water (Barth, et al, 2000). One of the better-known current eddies off the West Coast occurs in the Southern California Bight, between Point Conception and Baja California (Longhurst, 1998), wherein the current circles back on itself by moving in a northward and counterclockwise direction just within the Bight. The influence of these lesser current patterns and of the California Current on the physical and biological environment varies seasonally (Lynn, 1987) and through larger-scale climate variation, such as El Niño-La Niña or Pacific Decadal Oscillation (Longhurst, 1998).

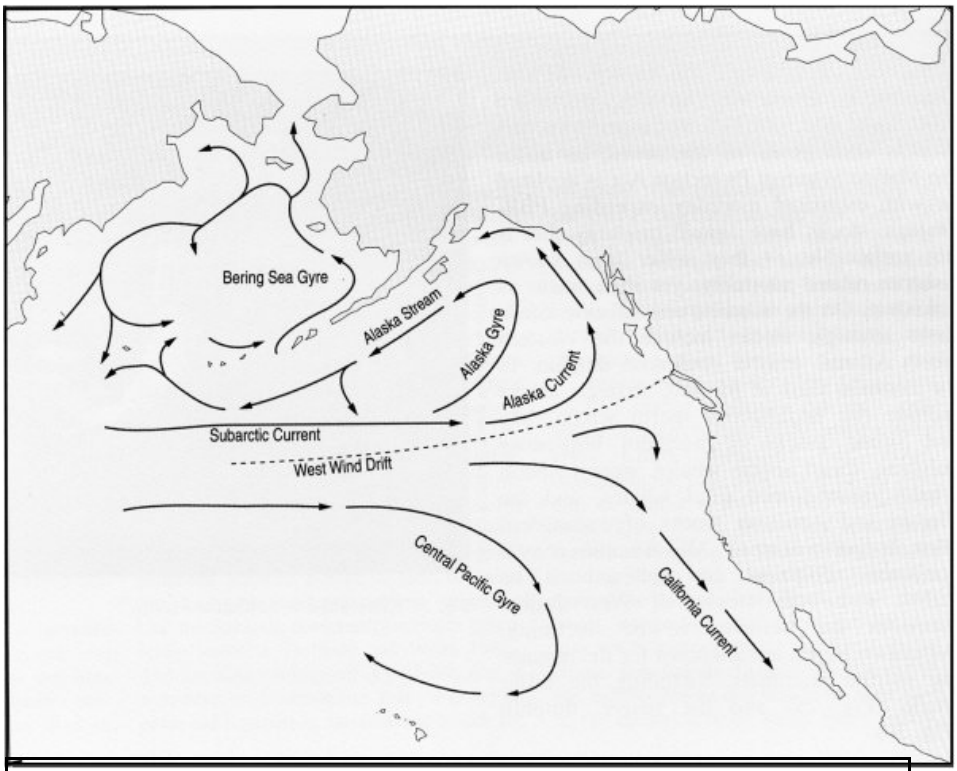


Figure 3.1.1 General circulation and current system of the North Pacific Ocean. NMFS

Topography. Physical topography off the U.S. West Coast is characterized by a relatively narrow continental shelf. The 200 m depth contour shows a shelf break closest to the shoreline off Cape Mendocino, Point Sur, and in the Southern California Bight and widest from central Oregon north to the Canadian border as well as off Monterey Bay. Deep submarine canyons pocket the EEZ, with depths greater than 4,000 m common south of Cape Mendocino.

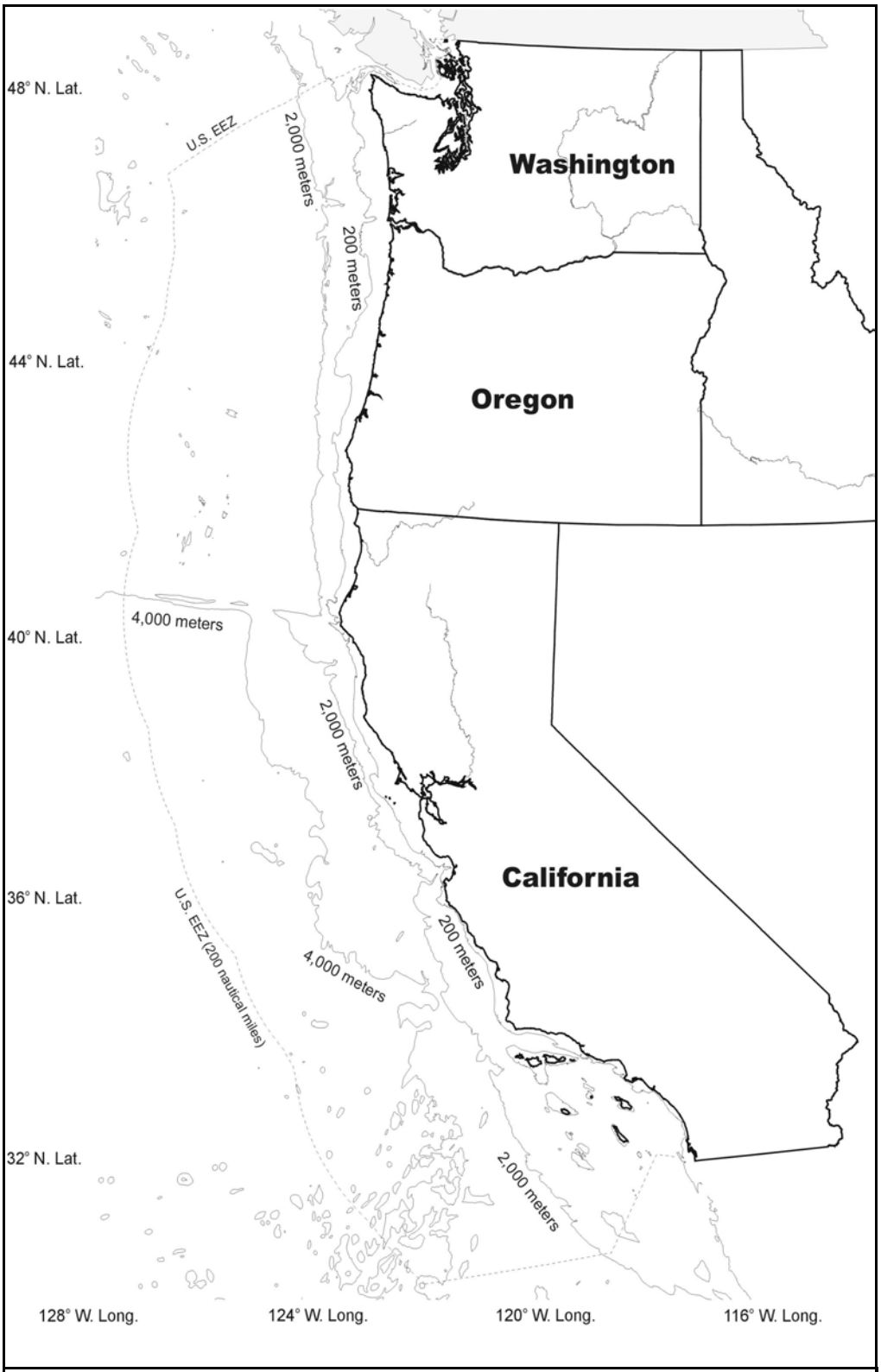


Figure 3.1.2 Bathymetric map of the U.S. West Coast EEZ: 200 m, 2000 m, 4000 m contours shown.

Climate Shifts. The physical dynamics and biological productivity of the California Current ecosystem have shown a variety of responses to both short- and long-scale changes in climate. For some groundfish species, these climate shifts may affect recruitment and abundance. El Niños and La Niñas are examples of short-scale climate change, six-month to two-year disruptions in oceanic and atmospheric conditions in the Pacific region. An El Niño is a climate event with trends like a slowing in Pacific Ocean equatorial circulation, resulting in warmer sea surface conditions and decreased coastal upwelling. Conversely, La Niñas are short-scale climate events characterized by cooler ocean temperatures (NOAA, 2002.) Long-scale Pacific Ocean climate shifts of two to three decades in duration are often called "Pacific (inter)Decadal Oscillation" or "PDO" in scientific literature. These long-scale climate shift events tend to show relatively cooler ocean temperatures in the Gulf of Alaska and Bering Sea ecosystems and relatively warmer temperatures in the California Current ecosystem, or a reverse trend of relatively warm temperatures in the north and cooler temperatures in the south (Mantua et al., 1997.)

Periods of warmer or cooler ocean conditions and the event of shifting from warm to cool or vice versa can all have a wide array of effects marine species abundance. Ocean circulation varies during these different climate events, affecting the degree to which nutrients from the ocean floor mix with surface waters. Periods of higher nutrient mixing tend to have higher phytoplankton (primary) productivity, which can have positive ripple effects throughout the food web. In addition to changes in primary production, climate shifts may affect zooplankton (secondary) production in terms of increasing or decreasing abundance of the zooplankton biomass as a whole or of particular zooplankton species. Again, these changes in secondary production ripple in effect through the food web (Francis et al., 1998.) Upper trophic level species depend on different lower order species for their diets, so a shift in abundance of one type of prey species will often result in a similar shift in an associated predator species. This shifting interdependency affects higher order species like groundfish in different ways at different life stages. In other words, some climate conditions may be beneficial to the survival of larvae of a particular species but may have no effect on an adult of that same species.

Population data on some species seems to show a link between climate and recruitment. Pacific whiting, for example, tends to have stronger year classes following an El Niño event than in other years (Hollowed et al., 2001.) There is also some evidence that sablefish recruitment may be affected by PDOs in that stronger year classes of sablefish tend to occur off British Columbia during decade-scale periods when ocean temperatures are relatively warm (King et al., 2000.) Although there are fewer analyses about the effects of climate on rockfish abundance coastwide, localized larval rockfish populations have shown lower survival rates in years when coastal upwelling and plankton production has been reduced by El Niño events (Yoklavich et al., 1996.)

Most of the scientific analysis on long-scale climate shift events has taken place within the past ten years. Recent public awareness of climate events like PDO, coupled with the relatively dramatic El Niño of 1997-1998 may create the perception that climate is the most significant contributor to marine species abundance. In an analysis of marine fish productivity in the Northeast Pacific Ocean, Hollowed, Hare, and Wooster found that links between marine fish recruitment and climate shifts were more clear for conservatively managed species (Hollowed, et al., 2001). For many of the depleted West Coast groundfish species, adult population levels may have a greater effect on the spawning productivity of the overall stock than climate shift events of either the short- or long-scale.

Essential Fish Habitat. The 80+ groundfish species managed by the FMP occur throughout the EEZ and occupy diverse habitats at all stages in their life histories. Some species are widely dispersed during certain life stages, particularly those with pelagic eggs and larvae; the essential fish habitat (EFH) for these species/stages is correspondingly large. On the other hand, the EFH of some species/stages may be comparatively small, such as that of adults of many nearshore rockfishes which show strong affinities to a particular location or type of substrate.

EFH for Pacific coast groundfish is defined as the aquatic habitat necessary to allow for groundfish production to support long-term sustainable fisheries for groundfish and for groundfish contributions to a

healthy ecosystem. Descriptions of groundfish fishery EFH for each of the 80+ groundfish species and their life stages result in over 400 EFH identifications. When these EFHs are taken together, the groundfish fishery EFH includes all waters from the mean higher high water line, and the upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon, and California seaward to the boundary of the U.S. EEZ.

The FMP groups the various EFH descriptions into seven major habitat types called "composite" EFHs. This approach focuses on ecological relationships among species and between the species and their habitat, reflecting an ecosystem approach in defining EFH. The seven "composite" EFH identifications are as follows:

1. Estuarine - Those waters, substrates and associated biological communities within bays and estuaries of the EEZ, from mean higher high water level (MHHW, which is the high tide line) or extent of upriver saltwater intrusion to the respective outer boundaries for each bay or estuary as defined in 33 CFR 80.1 (Coast Guard lines of demarcation).

2. Rocky Shelf - Those waters, substrates, and associated biological communities living on or within ten meters (5.5 fathoms) overlying rocky areas, including reefs, pinnacles, boulders and cobble, along the continental shelf, excluding canyons, from the high tide line MHHW to the shelf break (~200 meters or 109 fathoms).

3. Nonrocky Shelf - Those waters, substrates, and associated biological communities living on or within ten meters (5.5 fathoms) overlying the substrates of the continental shelf, excluding the rocky shelf and canyon composites, from the high tide line MHHW to the shelf break (~200 meters or 109 fathoms).

4. Canyon - Those waters, substrates, and associated biological communities living within submarine canyons, including the walls, beds, seafloor, and any outcrops or landslide morphology, such as slump scarps and debris fields.

5. Continental Slope/Basin - Those waters, substrates, and biological communities living on or within 20 meters (11 fathoms) overlying the substrates of the continental slope and basin below the shelf break (~200 meters or 109 fathoms) and extending to the westward boundary of the EEZ.

6. Neritic Zone - Those waters and biological communities living in the water column more than ten meters (5.5 fathoms) above the continental shelf.

7. Oceanic Zone - Those waters and biological communities living in the water column more than 20 meters (11 fathoms) above the continental slope and abyssal plain, extending to the westward boundary of the EEZ.

Life history and habitat needs for the 80+ species managed under the FMP are described in the EFH appendix to Amendment 11, which is available online at http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Groundfish Stock Assessments; Resource Surveys and Biology of the stocks

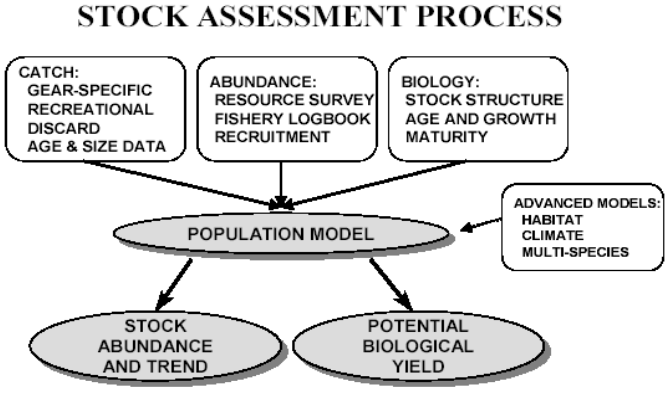
Data from resource surveys are combined with information derived from life-history studies and commercial landing statistics to calibrate models of groundfish population dynamics. These models are used to generate estimates of current abundance and fishing mortality levels, identify trends in abundance, and predict sustainable annual harvest levels for groundfish populations (Figure 3.2.2). The

Council considers output from the models when it establishes ABCs and setting annual harvest levels.

Stock Assessments Stock assessments for Pacific Coast groundfish are generally conducted by staff scientists of the California Department of Fish and Game (CDFG), Oregon Department of fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), Oregon State University (OSU), University of Washington (UW) and the Southwest, Northwest, and Alaska Fisheries Science Centers of NMFS. The purpose of groundfish stock assessments is to describe the condition or status of a particular stock. The result of a stock assessment is typically a report on the health of the stock, a forecast of biologically sustainable harvest levels, and/or other recommendations that would maintain or restore the stock. If a stock is determined to be in an overfished condition (less than 25% of its unfished biomass), a rebuilding analysis and a rebuilding plan are developed.

Over the past 20+ years, groundfish assessments have primarily been concentrated on important commercial and recreational species. These species account for most of the historical catch and have been the targets of fishery monitoring and resource survey programs that provide basic information for quantitative stock assessments. However, not all groundfish assessments have the same level of information and precision.

Quantitative and non-quantitative assessments are used for groundfish stocks. Stocks for which there are sufficient life history and fishery data have quantitative assessments. These stock assessments are conducted by using a life history data to build a biologically realistic model of the fish stock, and calibrating this model so that it reproduces the observed fishery and survey data as closely as possible. During the 1990s, most West Coast groundfish assessments were conducted using the stock synthesis model. Recently there has been development of similar, but more powerful, models using state-of-the-art software tools. Assessment models and results are independently reviewed by the Council's Stock Assessment Review (STAR) panels, which are made up of scientific professionals and reviewers from the Council's groundfish advisory bodies. It is the responsibility of the STAR panels to review draft stock assessment documents and relevant information to determine if they use the available scientific data effectively to provide a good quality assessment of the condition of the stock. In addition, the STAR panels review the assessment documents to see that they are sufficiently complete and that the research needed to improve assessments in the future is identified. (Table 3.2.1) 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 assessment results are as accurate and error-free as possible. In 2002, the Council introduced an expedited process for species with already-reviewed assessment models and new data inputs for those models. Unlike the full STAR process, the expedited process reviews just the application of updated data series to the existing model. New types of data and new model structures are not introduced.



Following review of assessment models by the STAR panels and subsequently the Groundfish Management Team (GMT) and Scientific and Statistical Committee (SSC), the GMT uses the reviewed assessments to recommend preliminary ABCs and OYs to the Council. The SSC comments on the STAR review results and the GMT recommendations. Biomass estimates from an assessment may be for a single year or they may be the

average of the present and several future years. In general, an ABC will be calculated by applying the appropriate harvest policy (MSY proxy) to the best estimate of current biomass. ABCs based on quantitative assessments remain in effect until revised by either a full or partial assessment.

Full assessments provide information on the abundance of the stock relative to historical and target levels, and provide information on current potential yield. Partial assessments do not have enough data to provide for a full assessment. Within the range of full assessments, there is a wide range of data availability and resulting assessment certainty. Approximately four to ten full assessments are conducted each year; 26 species have been assessed (with varying degrees of completeness and precision). Several species are assessed approximately every three to four years, however some have been assessed only once, and only Pacific whiting is examined annually (both partial and full assessments are used for whiting) .

Stocks with ABCs set by non-quantitative assessments typically do not have a recent, quantitative assessment, but there may be a previous assessment or some indicators of the status of the stock. Detailed biological information is not routinely available for these stocks, and ABC levels have typically been established on the basis of average historical landings. Typically, the spawning biomass, level of recruitment, or the current fishing mortality rates are unknown.

Many species have never been assessed and lack the data necessary to conduct even a qualitative assessment (i.e., is trend up, down or stable?). ABC values have been established for only about 30 stocks. The remaining species are incidentally landed and usually are not listed separately on fish landing receipts. Information from fishery independent surveys are often lacking for these stocks, because of their low abundance or because they are not vulnerable to survey sampling gear. Precautionary measures continue to be taken when setting harvest levels (the OYs) for species that have no or only rudimentary assessments. Since implementation of the 2000 specifications, ABCs have been reduced by 25 percent to set OYs for species with less rigorous stock assessments, and by 50 percent to set OYs for those species with no stock assessment. At-sea observer data, from the West Coast groundfish observer program implemented by Amendment 13 to the FMP, is expected to be available for use in the near future to upgrade the assessment capability or evaluate their overfishing potential for these stocks. Interim ABC values may be established for these stocks based on qualitative information.

The accuracy and reliability of various data used in assessments as well as on the scientific assumptions that the assessments are based on, need to be further analyzed to improve the quality of forecasts. Further analysis of issues such as uncertainty associated with fishery logbook data, calibration of surveys, and accuracy of aging techniques are also needed. In addition, information on ecosystem change and its influence on groundfish abundance is needed. Specific stock assessment areas that have been identified as needing improvement include: develop models to better quantify uncertainty and aid communication/ implementation of precautionary approach; develop models to specifically aid in the assessment of species with limited data; improve standardization of assessment methods and conduct a formal review of these methods so that the subsequent review of each species' assessment can be shortened, which could allow more assessments to be reviewed each year; develop models to better represent spatially-structured populations, e.g., populations with low rates of internal mixing or populations with ontogenetic patterns spanning a range of habitats.

Table 3.2.1 Research Needs Identified by Pacific Coast Groundfish Assessment Scientists

Species	Assemblage	Data needs identified by assessment scientists
Roundfish		
Lingcod	Shelf	* Improve age structure sample size in all areas *More frequent fishery independent surveys
Pacific Cod	Shelf	

Table 3.2.1 Research Needs Identified by Pacific Coast Groundfish Assessment Scientists		
Species	**Assemblage**	**Data needs identified by assessment scientists**
Pacific whiting	Mid-water	* Would benefit from increased survey observations
Sablefish	Deep slope	* Would benefit from increased survey observations * Need understanding of survey gear selectivity and catchability * May benefit from ichthyoplankton surveys * Would benefit from additional tagging surveys * Discard data needed * More biological samples from commercial catches
Flatfish		
Dover sole	Deep slope	* Additional research on age and growth to reduce variability * Need to examine depth strata data * Discard data needed
English sole	Nearshore	* Need more age, maturity and length data * Need recent fecundity data * Additional research on aging needed *More biological samples from commercial catches * Shelf survey designed for rockfish, not flatfish
Petrale sole	Nearshore	* Genetic identity of stock * More biological samples from commercial catches * Need otoliths from juvenile fish take in survey catches * Discard data needed * Need understanding of survey gear selectivity and catchability
Arrowtooth flounder	Shelf, Slope	* Discard data needed * Need reliable measure of abundance * Shelf survey designed for rockfish, not flatfish * Need to validate aging methods
Rockfish		
POP	Slope	* Further age analysis * Need further analysis of unfished biomass
Shortbelly	Shelf	* Further work on year class strength and life history needed
Widow	Shelf	* Need reliable measure of abundance * Discard data needed * Genetic identity of stock needed * Need more age, maturity, and length data
Canary	Shelf	* Determine why there is an absence of older females in survey data * Better understanding of survey gear selectivity and catchability * Evaluate spawner-recruit relationships * At-sea observer data needed * Identify habitat and distribution * Expand assessment area to include Canada * Need pre-recruit surveys
Chilipepper	Shelf	* Would benefit from increased survey observations
Bocaccio	Shelf	* Review natural mortality assumptions * Examine geographic relationships
Splitnose	Slope	* Need more age, maturity and length data * Need at-sea discard data * Commercial fishery landings by species needed

Table 3.2.1 Research Needs Identified by Pacific Coast Groundfish Assessment Scientists		
Species	**Assemblage**	**Data needs identified by assessment scientists**
Yellowtail	Shelf	* Age and maturity data need to be updated * Better understanding of survey gear selectivity and catchability * Genetic identity of stocks needed
Shortspine thornyhead	Deep slope	* XXXXXXXX
Longspine thornyhead	Deep slope	* XXXXXXXX
Darkblotched	Slope	* Better commercial fishery landings by species * Discard data needed * Need more age, maturity and length data *Genetic identity of stocks needed * Better understanding of survey gear selectivity and catchability
Yelloweye	Shelf	* Need more age, maturity and length data * Identify habitat and distribution * Develop fishery independent indices * Need reliable method to measure abundance
Cowcod	Shelf	* Need to validate aging methods *Identify habitat and distribution
Remaining Rockfish	All	* XXXXXXXX
Bank	Slope (mid-water)	* Commercial fishery landings by species needed * More commercial fishery age and length data * Need discard data * Better documentation of recreational catch * Need reliable index of recruitment
Black	Nearshore	* XXXXXXXX
Blackgill	Slope	* XXXXXXXX

Resource Surveys Normally a resource survey is implemented as a long-term, ongoing index to track natural and anthropogenic changes in fish abundance. In some cases, a single survey or a short time series can be directly calibrated to absolute abundance. An annual survey will most closely track natural biological fluctuations and smooth out apparent fluctuations caused by environmental effects on catchability.

For the purpose of conducting resource surveys, the groundfish species can be roughly broken into six assemblages based upon their adult habitat and co-occurrence in the fishery. *Midwater species* are semipelagic schooling species such as Pacific whiting and shortbelly rockfish. These species can be surveyed with acoustic methods. *Deep slope species* primarily includes sablefish, Dover sole, shortspine thornyhead, longspine thornyhead, and Pacific grenadier. They are found mostly on trawlable habitat on the shelf break and continental slope extending out to at least 1500 m bottom depth. Most of these species recruit on the shelf and gradually move into deeper water as they age. *Shelf species* include 30 rockfish species, lingcod, and Pacific cod. These species occur on the continental shelf. Many species are found over rocky habitat, and some species have notable off-bottom tendencies. *Slope rockfish species* includes nine rockfish species found on the upper continental slope. *Nearshore rockfish species* include13 rockfish species and a few non-rockfish species. These are mostly found in high relief habitat. *Nearshore flatfish species* include 11 flatfish species that are found on trawlable, sand-mud habitat on the continental shelf.

Long term groundfish survey efforts include: 1) *Acoustic and midwater trawl survey* - a coastwide survey that has been conducted triennially (1977-2001) for Pacific whiting, but which is now conducted biennially. Recent surveys have been coordinated with the Canadian acoustic survey to assure adequate coverage in northern areas. The survey now ranges from southern California (36°30' N. lat.) to Dixon Entrance, British Columbia (54°30' N. lat.) 2) *Shelf survey* - a bottom trawl survey conducted triennially (1977-2001) in midsummer for all fish in groundfish FMP, with sufficient coastwide coverage for most target species but did not cover south of Point Conception until 2002; survey covers the 30-275 fathoms range of bottom depths using four chartered vessels. 3) *Slope survey* - a bottom trawl survey conducted annually in mid-autumn, covers 100-700 fathom range of bottom depth coastwide, and which began in 1998 and 1999. Shelf and slope surveys will be combined for 2003. 4) *Nearshore survey* - these are SCUBA and hook-and-line surveys for various nearshore rockfish off California and are conducted by CDFG. 5) *Mark-recapture survey* for black rockfish and lingcod by WDFW. 6) *Shelf rockfish recruitment survey* - midwater trawl survey off Central California by Southwest Fisheries Science Center (SWFSC) for age 0 rockfish. 7) *Multi-species - multi-disciplinary oceanographic and egg and larvae survey* off southern California (California Cooperative Oceanographic Fisheries Investigation (CalCOFI)) which is currently conducted quarterly. NWFSC has indicated that further development of resource surveys is needed to provide an index of spawning biomass. Increasing the number of surveys and geographic scope would provide information about distribution, abundance, and age structure of many groundfish populations.

The West Coast Groundfish Research Plan identifies the following areas where further resources could be used to improve the accuracy and precision of stock assessments: development of survey methods for each of the groundfish assemblages and for each region of the coast; determine potential improvement in survey accuracy by stratifying survey effort on finer habitat features; evaluate alternative survey methodologies including egg and larval surveys, mark recapture, hook-and-line, and visual; improve tracking of natural fluctuations in Pacific whiting abundance and US-Canada distribution by increasing frequency of whiting acoustic survey (currently triennial); improving time series data, and egg and larval surveys may have useful information for some groundfish; direct calibration of surveys; direct observation of fish density using visual and laser methods; investigate catchability characteristics of sampling methods, in particular fish behavior in response to sampling gear, and environmental effects on fish-gear interactions.

Life history and stock distribution Biological data is necessary for accurate stock assessments and other fishery evaluations. This includes basic biological information such as stock structure, age compositions, growth, and reproduction. Currently, stock distribution and movement information for egg, larval, juvenile, and adult life stages is determined from plankton surveys, fishery resource assessment surveys, fishery logbooks, and tagging studies. Genetic characteristics and species' population structure has been investigated for a few major groundfish species using mapping, genetics, morphology, parasites, micro-constituents and other methods. "Production aging" of fishery and survey specimens for major species is done to determine patterns in recruitment and to enable age-based assessment methods. Validation of aging methods include radiometric, tag-recapture, and other techniques.

To further improve the base biological data used in assessments, scientists at the NWFSC have identified the following areas where resources are needed for improvement: age-specific growth and reproduction (maturity and fecundity) for more species; new methods to estimate natural mortality rates; genetic examination of stock structure for more species with high probabilities of having separate distinct populations; degree of mixing between and within populations; temporal and spatial trends in growth and maturation; life-history data on fish health and fitness (e.g., disease, parasite loads, bioenergetic indicators such as lipid and protein content).

Fishery mortality Total fishery catch data is needed so that stock assessment models can correctly separate fishing from natural causes or changes in fish abundance, and so that the effectiveness of current regulations may be determined. Data needed on an ongoing basis includes: timely estimates of total commercial and recreational catch for each gear, location and time stratum; information on bycatch, discards, and mortality of discarded bycatch; biological characteristics (age and size composition) of the

catch; standardized measurement of fishing effort and catch-per-effort; fishery-independent resource survey data; geographic distribution of catch and effort.

Currently landed commercial catch is monitored shoreside by the states and PSMFC with coastwide data access through the PacFIN data system. The basic program is based upon comprehensive mandatory commercial landings receipts to determine landed catch, and biological samples by port biologists to determine species composition of each market category and to collect size and age data. The growing nearshore commercial groundfish fisheries, including the live rockfish fishery, are monitored by state programs. Recreational fishery catch is estimated from interviews and other statistical sampling methods. There are state programs and the federal Marine Recreational Fisheries Statistics (MRFSS) program to estimate recreational catch. The catch made by or delivered to the at-sea whiting processors is monitored by observers on commercial vessels to monitor discarded catch, sample for catch composition, and collect biological data.

Trawl logbooks have been used to collect tow-by-tow data on trawl fishing effort and retained catch. Data from the three state programs are now mirrored in PacFIN. Statistical analyses to standardize fishing effort over time and between vessels have been conducted by NMFS and academic researchers. Commercial Passenger Fishing Vessels (head boats) have a logbook program in California that has been used in some stock assessments. Logbooks exist for some nontrawl commercial gears in some states, but there is no computerized database or concentrated effort at standardization or compliance.

3.3.2 Stock Status for Pacific Coast Groundfish Species

Each fishing year, the Council uses the best available stock assessment data to evaluate the biological condition of the Pacific Coast groundfish fishery and to develop estimates of ABCs for major groundfish stocks. The ABCs are biologically based estimates of the amount of fish that may be harvested from the fishery each year without jeopardizing the resource. The ABC may be modified to incorporate biological safety factors and risk assessment due to uncertainty.

The ABC for a species or species group is generally derived by multiplying the harvest rate proxy (F_{MSY} proxy) by the exploitable biomass. When setting the 2002 ABCs, the Council maintained a policy of using a default harvest rate as a proxy for the fishing mortality rate (F_{MSY} proxy) that is expected to achieve the maximum sustainable yield. Harvest rate policies must account for several complicating factors, including the age and size at which individuals in a stock reach maturity, the relative fecundity of mature individuals over time, and the optimal stock size for the highest level of productivity within that stock. Default harvest rate proxies were recommended by the Council's Scientific and Statistical Committee (SSC) in 2001 (66 FR 2338, January 11, 2001) continued to be used in 2002. These recommended harvest rate proxies are: $F_{40\%}$ for flatfish and whiting, $F_{50\%}$ for rockfish (including thornyheads,) and $F_{45\%}$ for other groundfish such as sablefish and lingcod (PFMC 2000).

Harvest levels or OYs are established each year for the species or species groups that the Council proposes to manage. Groundfish species and species groups with OYs include bocaccio, canary rockfish, chilipepper rockfish, cowcod, darkblotched rockfish, Dover sole, lingcod, longspine thornyhead, the minor rockfish complexes (northern and southern for nearshore, continental shelf, and continental slope species,) Pacific cod, Pacific ocean perch, Pacific whiting, sablefish, shortbelly rockfish, shortspine thornyhead, splitnose rockfish, widow rockfish, yelloweye rockfish, and yellowtail rockfish. Numerical OYs are not set for every stock, especially where harvest has been less than ABC.

The Magnuson-Stevens Act requires an FMP to prevent overfishing. Overfishing is defined in the National Standards Guidelines (63 FR 24212, May 1, 1998) as exceeding the fishing mortality rate needed to produce maximum sustainable yield. The OY harvest levels are set at levels that are expected to prevent overfishing, equal to or less than the ABCs. The term "overfished" describes a stock whose abundance is below its overfished/rebuilding threshold. Overfished/rebuilding thresholds are generally linked to the same productivity assumptions that determine the ABC levels. The default value of this threshold is 25%

of the estimated unfished biomass level or 50% of B_{MSY}, if known. Nine groundfish species are below the overfished threshold in 2002: bocaccio, canary rockfish, cowcod (south of Point Conception,) darkblotched rockfish, lingcod, Pacific whiting, Pacific ocean perch, widow rockfish, and yelloweye rockfish.

Table 3.2.1 , Summary of Stock Status for Pacific Coast Groundfish Species, summarizes the biological condition of the Pacific Coast groundfish stocks. More detailed information on the status of each of these species or species groups is available in the stock assessments associated with the annual SAFE report, as well as in the Environmental Impact Statement for Proposed Groundfish ABC and OY specifications and management measures for the 2003 Pacific Coast Groundfish Fishery. These documents are available from the Council office.

Table 3.2.2 Summary of Stock Status for Pacific Coast Groundfish Species

Species	Year of Most Recent Stock Assessment	Biomass Estimate (Percent of Unfished)	Did overfishing Occur in 2001? Was the fishing mortality above the MSST[1]?	Is the stock overfished in 2001? Was the Biomass below the MSST threshold?
Roundfish				
Lingcod	2001 revision	15%	No	Yes
Pacific Cod			Unknown	Unknown
Pacific whiting	2002	24%	Yes	Yes
Sablefish	2001	27%-38%	No	No
Flatfish				
Dover sole	2001	29%	No	No
English sole	1993		Unknown	Unknown
Petrale sole	1999	42%	Unknown	Unknown
Arrowtooth flounder	1993		No	No
Other flatfish			Unknown	Unknown
Rockfish				
POP	2000	xxx ? xxx	No	Yes
Shortbelly	1989	>43%	No	No
Widow	2000	24%	No	Yes
Canary	1999	22% North 8% South	No	Yes
Chilipepper	1998	46%-61%	No	No
Bocaccio	1999	2% South	No	Yes
Splitnose	1994		Unknown	Unknown
Yellowtail	2000	63%	No	No
Shortspine thornyhead	2001	25%-50%	No	No
Longspine thornyhead	1998	>40%	No	No

Table 3.2.2 Summary of Stock Status for Pacific Coast Groundfish Species				
Species	Year of Most Recent Stock Assessment	Biomass Estimate (Percent of Unfished)	Did overfishing Occur in 2001? Was the fishing mortality above the MSST[1]?	Is the stock overfished in 2001? Was the Biomass below the MSST threshold?
Darkblotched	2000	12%	No	Yes
Yelloweye	2001	7%	No	Yes
Cowcod	1999	4%-11%	No	Yes
Bank	xxx ? xxx		No	No
Black	1999 & 2001[2]	35%[2]	No	No
Blackgill	1998	51%	Unknown	Unknown
Redstripe			Unknown	Unknown
Sharpchin			Unknown	Unknown
Silvergrey			No	Unknown
Yellowmouth			Unknown	Unknown
Other rockfish			Unknown	Unknown
Other fish			Unknown	Unknown

1) MSST – The minimum stock size threshold (overfished/rebuilding threshold) is the default value of 25% of the estimated unfished biomass level or 50% of B_{MSY}, if known.
2) 2001 update completed for Oregon only.

3.2.3 Groundfish Resources

The Pacific Coast groundfish FMP manages over 80 species which are divided by type as follows: roundfish, flatfish, rockfish, sharks, skates, ratfish, morids, and grenadiers. These species, occur throughout the EEZ and occupy diverse habitats at all stages in their life history. Information on the interactions between the various groundfish species and between groundfish and non-groundfish species varies in completeness. While a few species have been intensely studied, there is relatively little information on most groundfish species

Roundfish

Lingcod (*Ophiodon elongatus*), a top order predator of the family Hexagrammidae, ranges from Baja California to Kodiak Island in the Gulf of Alaska. Lingcod is demersal at all life stages (Allen & Smith 1988, NOAA 1990, Shaw & Hassler 1989). Adult lingcod prefer two main habitat types: slopes of submerged banks 10-70 m below the surface with seaweed, kelp and eelgrass beds and channels with swift currents that flow around rocky reefs (Emmett et al. 1991, Giorgi & Congleton 1984, NOAA 1990, Shaw & Hassler 1989). Juveniles prefer sandy substrates in estuaries and shallow subtidal zones (Emmett et al. 1991, Forrester 1969, Hart 1973, NOAA 1990, Shaw & Hassler 1989). As the juveniles grow they move to deeper waters. Adult lingcod are considered a relatively sedentary species, but there are reports of migrations of greater than 100 km by sexually immature fish (Jagielo 1990, Mathews & LaRiviere 1987, Mathews 1992, Smith et al. 1990).

Mature females live in deeper water than males and move from deep water to shallow water in the winter to spawn (Forrester 1969, Hart 1973, Jagielo 1990, LaRiviere et al. 1980, Mathews & LaRiviere 1987, Mathews 1992, Smith et al. 1990). Mature males may live their whole lives associated with a single rock reef, possibly out of fidelity to a prime spawning or feeding area (Allen & Smith 1988, Pikitch 1989, Shaw & Hassler 1989). Spawning generally occurs over rocky reefs in areas of swift current (Adams 1986,

Adams & Hardwick 1992, Giorgi 1981, Giorgi & Congleton 1984, LaRiviere et al. 1980). After the females leave the spawning grounds, the males remain in nearshore areas to guard the nests until the eggs hatch. Hatching occurs in April off Washington but as early as January and as late as June at the geographic extremes of the lingcod range. Males begin maturing at about 2 years (50 cm), whereas females mature at 3+ years (76 cm). In the northern extent of their range, fish mature at an older age and larger size (Emmett et al. 1991, Hart 1973, Mathews & LaRiviere 1987, Miller & Geibel 1973, Shaw & Hassler 1989). The maximum age for lingcod is about 20 years (Adams & Hardwick 1992).

Lingcod are a visual predator, feeding primarily by day. Larvae are zooplanktivores (NOAA 1990). Small demersal juveniles prey upon copepods, shrimps and other small crustaceans. Larger juveniles shift to clupeids and other small fishes (Emmett et al. 1991, NOAA 1990). Adults feed primarily on demersal fishes (including smaller lingcod), squids, octopi and crabs (Hart 1973, Miller & Geibel 1973, Shaw & Hassler 1989). Lingcod eggs are eaten by gastropods, crabs, echinoderms, spiny dogfish, and cabezon. Juveniles and adults are eaten by marine mammals, sharks, and larger lingcod (Miller & Geibel 1973, NOAA 1990)

Pacific Cod (*Gadus macrocephalus*) are widely distributed in the coastal north Pacific, from the Bering Sea to southern California in the east, and to the Sea of Japan in the west. Adult Pacific cod occur as deep as 875 m (Allen & Smith 1988), but the vast majority occurs between 50 and 300 m (Allen & Smith 1988, Hart 1973, Love 1991, NOAA 1990). Along the West Coast, Pacific cod prefer shallow, soft-bottom habitats in marine and estuarine environments (Garrison & Miller 1982), although adults have been found associated with coarse sand and gravel substrates (Palsson 1990, Garrison & Miller 1982). Larvae and small juveniles are pelagic; large juveniles and adults are parademersal (Dunn & Matarese 1987, NOAA 1990). Adult Pacific cod are not considered to be a migratory species. There is however a seasonal bathymetric movement from deep spawning areas of the outer shelf and upper slope in fall and winter to shallow middle-upper shelf feeding grounds in the spring (Dunn & Matarese 1987, Hart 1973, NOAA 1990, Shimada & Kimura 1994).

Pacific cod have external fertilization (Hart 1973, NOAA 1990) and spawning from late fall to early spring. Their eggs are demersal. Larvae may be transported to nursery areas by tidal currents (Garrison & Miller 1982). Half of females are mature by 3 years (55 cm), and half of males are mature by 2 years (45 cm) (Dunn & Matarese 1987, Hart 1973). Juveniles and adults are carnivorous, and feed at night (Allen & Smith 1988, Palsson 1990) with the main part of the adult Pacific cod diet being whatever prey species is most abundant (Kihara & Shimada 1988,Klovach et al. 1995). Larval feeding is poorly understood. Pelagic fish and sea birds eat Pacific cod larvae, while juveniles are eaten by larger demersal fishes, including Pacific cod. Adults are preyed upon by toothed whales, Pacific halibut, salmon shark, and larger Pacific cod (Hart 1973, Love 1991, NOAA 1990, Palsson 1990). The closest competitor of the Pacific cod for resources is the sablefish (Allen 1982).

Pacific Whiting (*Merluccius productus*), also known as Pacific hake, is a semi-pelagic merlucciid (a cod-like fish species) that range from Sanak Island in the western Gulf of Alaska to Magdalena Bay, Baja California Sur. They are most abundant in the California Current System (Bailey 1982, Hart 1973, Love 1991, NOAA 1990). Smaller populations of Pacific whiting occur in several of the larger semi-enclosed inlets of the northeast Pacific Ocean, including the Strait of Georgia, Puget Sound, and the Gulf of California (Bailey et al. 1982, Stauffer 1985). The highest densities of Pacific hake are usually between 50 and 500 m, but adults occur as deep as 920 m and as far offshore as 400 km (Bailey 1982, Bailey et al. 1982, Dark & Wilkins 1994, Dorn 1995, Hart 1973, NOAA 1990, Stauffer 1985). Hake school at depth during the day, then move to the surface and disband at night for feeding (McFarlane & Beamish 1986, Sumida & Moser 1984, Tanasich et al. 1991). Coastal stocks spawn off Baja California in the winter, then the mature adults begin moving northward and inshore, following food supply and Davidson currents (NOAA 1990). Hake reach as far north as southern British Columbia by fall. They then begin the southern migration to spawning grounds and further offshore (Bailey et al. 1982, Dorn 1995, Smith 1995, Stauffer 1985).

Spawning occurs from December through March, peaking in late January (Smith 1995). Pacific hake are oviparous with external fertilization. Eggs of the Pacific hake are neritic and float to neutral buoyancy (Baily 1981, Bailey et al. 1982, NOAA 1990). Hatching occurs in 5-6 days and within 3-4 months juveniles are typically 35 mm (Hollowed 1992). Juveniles move to deeper water as they get older (NOAA 1990). Females off mature at 3-4 years (34-40 cm,) and nearly all males are mature by 3 years (28 cm). Females grow more rapidly than males after four years; growth ceases for both sexes at 10-13 years (Bailey et al. 1982).

All life stages feed near the surface late at night and early in the morning (Sumida & Moser 1984). Larvae eat calanoid copepods, as well as their eggs and nauplii (McFarlane & Beamish 1986, Sumida & Moser 1984). Juveniles and small adults feed chiefly on euphausiids (NOAA 1990). Large adults also eat amphipods, squid, herring, smelt, crabs, and sometimes juvenile hake (Bailey 1982, Dark & Wilkins 1994, McFarlane & Beamish 1986, NOAA 1990). Eggs and larvae of Pacific hake are eaten by pollock, herring, invertebrates, and sometimes hake. Juveniles are eaten by lingcod, Pacific cod and rockfish species. Adults are preyed on by sablefish, albacore, pollock, Pacific cod, marine mammals, soupfin sharks and spiny dogfish (Fiscus 1979, McFarlane & Beamish 1986, NOAA 1990).

Sablefish (*Anoplopoma fimbria*) are abundant in the north Pacific, from Honshu Island, Japan, north to the Bering Sea, and southeast to Cedros Island, Baja California. There are at least three genetically distinct populations off the West Coast of North America: one south of Monterey characterized by slower growth rates and smaller average size, one that ranges from Monterey to the U.S./Canada border that is characterized by moderate growth rates and size, and one ranging off British Columbia and Alaska characterized by fast growth rates and large size. Large adults are uncommon south of Point Conception (Hart 1973, Love 1991, McFarlane & Beamish 1983a, McFarlane & Beamish 1983b, NOAA 1990). Adults are found as deep as 1,900 m, but are most abundant between 200 and 1,000 m (Beamish & McFarlane 1988, Kendall & Matarese 1987, Mason et al. 1983). Off southern California, sablefish were abundant to depths of 1500 m (MBC 1987). Adults and large juveniles commonly occur over sand and mud (McFarlane & Beamish 1983a, NOAA 1990) in deep marine waters. They were also reported on hard-packed mud and clay bottoms in the vicinity of submarine canyons (MBC 1987).

Spawning occurs annually in the late fall through winter in waters greater than 300 m (Hart 1973, NOAA 1990). Sablefish are oviparous with external fertilization (NOAA 1990). Eggs hatch in about 15 days (Mason et al. 1983, NOAA 1990) and are demersal until the yolk sac is absorbed (Mason et al. 1983). After yolk sac is absorbed, the age-0 juveniles become pelagic. Older juveniles and adults are benthopelagic. Larvae and small juveniles move inshore after spawning and may rear for up to four years (Boehlert & Yoklavich 1985, Mason et al. 1983). Older juveniles and adults inhabit progressively deeper waters. The best estimates indicate that 50% of females are mature at 5-6 years (24 inches), and 50% of males are mature at 5 years (20 inches).

Sablefish larvae prey on copepods and copepod nauplii. Pelagic juveniles feed on small fishes and cephalopods, mainly squids (Hart 1973, Mason et al. 1983). Demersal juveniles eat small demersal fishes, amphipods and krill (NOAA 1990). Adult sablefish feed on fishes like rockfishes and octopus (Hart 1973, McFarlane & Beamish 1983a). Larvae and pelagic juvenile sablefish are heavily preyed upon by sea birds and pelagic fishes. Juveniles are eaten by Pacific cod, Pacific halibut, lingcod, spiny dogfish, and marine mammals, such as Orca whales (Cailliet et al. 1988, Hart 1973, Love 1991, Mason et al. 1983, NOAA 1990). Sablefish compete with many other co-occurring species for food, mainly Pacific cod and spiny dogfish (Allen 1982).

Flatfish

Dover Sole (*Microstomus pacificus*) are distributed from the Navarin Canyon in the northwest Bering Sea and westernmost Aleutian Islands to San Cristobal Bay, Baja California (Hagerman 1952, Hart 1973, NOAA 1990). Dover sole are a dominant flatfish on the continental shelf and slope from Washington to

southern California. Adults are demersal and are found from 9-1,450 m, with highest abundance below 200-300 m (Allen & Smith 1988). Adults and juveniles, show a high affinity toward soft bottoms of fine sand and mud. Juveniles are often found in deep nearshore waters. Dover sole are considered to be a migratory species. In the summer and fall, mature adults and juveniles can be found in shallow feeding grounds, as shallow as 55 m off British Columbia (Westrheim & Morgan 1963). By late fall, the Dover sole begin moving offshore into deep waters (400 m or more) to spawn. Although there is an inshore-offshore seasonal migration, little north-south coastal migration occurs (Westrheim & Morgan 1963)

Spawning occurs from November-April off Oregon and California (Hart 1973, NOAA 1990, Pearcy et al. 1977) in waters 80-550 m depth at or near the bottom (Hagerman 1952, Hart 1973, Pearcy et al. 1977). Dover sole are oviparous; fertilization is external. Larvae are planktonic, being transported offshore and to nursery areas by ocean currents and winds for up to two years. Settlement to benthic living occurs mid-autumn to early spring off Oregon, and February-July off California (Markle et al 1992). Juvenile fish move into deeper water with age, and begin seasonal spawning-feeding migrations upon reaching maturity.

Dover sole larvae eat copepods, eggs and nauplii, as well as other plankton. Juveniles and adults eat polychaetes, bivalves, brittlestars and small benthic crustaceans. Dover sole feed diurnally by sight and smell (Dark & Wilkins 1994, Gabriel & Pearcy 1981, Hart 1973, NOAA 1990). Dover sole larvae are eaten by pelagic fishes like albacore, jack mackerel and tuna, as well as sea birds. Juveniles and adults are preyed upon by sharks, demersally feeding marine mammals, and to some extent by sablefish (NOAA 1990). Dover sole compete with various eelpout species, rex sole, English sole, and other fishes of the mixed species flatfish assemblage (NOAA 1990).

English Sole (*Parophrys vetulus*) are found from Nunivak Island in the southeast Bering Sea and Agattu Island in the Aleutian Islands, to San Cristobal Bay, Baja California Sur (Allen & Smith 1988). In research survey data, nearly all occurred at depths <250 m (Allen & Smith 1988). Adults and juveniles prefer soft bottoms composed of fine sands and mud (Ketchen 1956), but also occur in eelgrass habitats (Pearson & Owen 1992). English sole uses nearshore coastal and estuarine waters as nursery areas (Krygier & Pearcy 1986, Rogers et al. 1988**)**. Adults make limited migrations. Those off Washington show a northward post-spawning migration in the spring on their way to summer feeding grounds, and a southerly movement in the fall (Garrison & Miller 1982). Tagging studies have identified separate stocks based on this species' limited movements and meristic characteristics (Jow 1969).

Spawning occurs over soft-bottom mud substrates (Ketchen 1956) from winter to early spring depending on the stock. Eggs are neritic and buoyant, but sink just before hatching (Hart 1973), juveniles and adults are demersal (Garrison & Miller 1982). Small juveniles settle in the estuarine and shallow nearshore areas all along the coast, but are less common in southerly areas, particularly south of Point Conception. Large juveniles commonly occur up to depths of 150 m. Although many postlarvae may settle outside of estuaries, most will enter estuaries during some part of their first year of life (Gunderson et al. 1990). Some females mature as 3-year-olds (26 cm), but all females over 35 cm long are mature. Males mature at 2 years (21 cm).

Larvae are planktivorous. Juveniles and adults are carnivorous, eating copepods, amphipods, cumaceans, mysids, polychaetes, small bivalves, clam siphons, and other benthic invertebrates (Allen 1982, Becker 1984, Hogue & Carey 1982, Simenstad et al. 1079) . English sole feed primarily by day, using sight and smell, and sometimes dig for prey (Allen 1982, Hulberg & Oliver 1979). A juvenile English sole's main predators are probably piscivorous birds such as great blue heron (Ardia herodias), larger fishes and marine mammals. Adults may be eaten by marine mammals, sharks, and other large fishes.

Petrale Sole (*Eopsetta jordani*) are found form Cape St. Elias, Alaska to Coronado Island, Baja California. The range may possibly extend into the Bering Sea, but the species is rare north and west of southeast Alaska and in the inside waters of British Columbia (Garrison & Miller 1982, Hart 1973). Nine separate breeding stocks have been identified, although stocks intermingle on summer feeding grounds (Hart

1973, NOAA 1990). Of these nine, one occurs off British Columbia, two off Washington, two off Oregon and four off California (NOAA 1990). Adults are found from the surf line to 550 m, but their highest abundance is <300 m (NOAA 1990). Adults migrate seasonally between deepwater, winter spawning areas to shallower, spring feeding grounds (NOAA 1990). They show an affinity to sand, sandy mud and occasionally muddy substrates (NOAA 1990).

Spawning occurs over the continental shelf and continental slope to as deep as 550 m. Eggs are pelagic and juveniles and adults are demersal (Garrison & Miller 1982). Eggs and larvae are transported from offshore spawning areas to nearshore nursery areas by oceanic currents and wind. Larvae metamorphose into juveniles at six months (22 cm) and settle to the bottom of the inner continental shelf (Pearcy et al. 1977). Petrale sole tend to move into deeper water with increased age and size. Petrale sole begin maturing at three years. Half of males mature by seven years (29-43 cm) and half of the females are mature by eight years (>44 cm) (Pedersen 1975a, Pedersen 1975b). Near the Columbia River, petrale sole mature one to two years earlier (Pedersen 1975a, Pedersen 1975b).

Larvae are planktivorous. Small juveniles eat mysids, sculpins and other juvenile flatfishes. Large juveniles and adults eat shrimps and other decapod crustaceans, as well as euphausiids, pelagic fishes, ophiuroids and juvenile petrale sole (Garrison & Miller 1982, Hart 1973, 162, NOAA 1990, Pearcy et al. 1977, Pedersen 1975a, Pedersen 1975b). Petrale sole eggs and larvae are eaten by planktivorous invertebrates and pelagic fishes. Juveniles are preyed upon (sometimes heavily) by adult petrale sole, as well as other large flatfishes. Adults are preyed upon by sharks, demersally feeding marine mammals, and larger flatfishes and pelagic fishes (NOAA 1990). Petrale sole competes with other large flatfishes. It has the same summer feeding grounds as lingcod, English sole, rex sole and Dover sole (NOAA 1990).

Arrowtooth Flounder (*Atheresthes stomias*) range from the southern coast of Kamchatka to the northwest Bering Sea and Aleutian Islands to San Simeon, California. Arrowtooth flounder is the dominant flounder species on the outer continental shelf from the western Gulf of Alaska to Oregon. Eggs and larvae are pelagic; juveniles and adults are demersal (Garrison & Miller 1982, NOAA 1990). Juveniles and adults are most commonly found on sand or sandy gravel substrates, but occasionally occur over low-relief rock-sponge bottoms Arrowtooth flounder exhibit a strong migration from shallow water summer feeding grounds on the continental shelf to deep water spawning grounds over the continental slope (NOAA 1990). Depth distribution may vary from as little as 50 m in summer to more than 500 m in the winter (NOAA 1990, Rickey 1995).

Arrowtooth flounder are oviparous with external fertilization (Barry 1996). Spawning may occur deeper than 500 m off Washington (Rickey 1995). Larvae eat copepods, their eggs and copepod nauplii (Yang 1995, Yang & Livingston 1985). Juveniles and adults feed on crustaceans (mainly ocean pink shrimp and krill) and fish (mainly gadids, herring and pollock) (Hart 1973, NOAA 1990). Arrowtooth flounder exhibit two feeding peaks, at noon and midnight

"Other Flatfish" are those species that do not have individual ABC/OYs and include butter sole, curlfin sole, flathead sole, Pacific sand dab, rex sole, rock sole, sand sole, and starry flounder. Life history descriptions of these species may be found in the Essential Fish Habitat West Coast Groundfish which was prepared for Amendment 11 to the FMP. This document may be requested from the Council office or is available online at http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html

Rockfish

Pacific ocean perch (*Sebastes alutus*) are found from La Jolla (southern California) to the western boundary of the Aleutian Archipelago (Eschmeyer et al 1983, Gunderson 1971, to 1986, Miller & Lea 1972), but are common from Oregon northward (Eschmeyer et al 1983). Pacific ocean perch primarily inhabit waters of the upper continental slope (Dark & Wilkins 1994) and are found along the edge of the continental shelf (Archibald et al. 1983). Pacific ocean perch occur as deep as 825 m, but usually are at 100-450 m and along submarine canyons and depressions (NOAA 1990). Larvae and juveniles are

pelagic; subadults and adults are benthopelagic. Adults form large schools 30 m wide, to 80 m deep, and as much as 1,300 m long (NOAA 1990). They also form spawning schools (Gunderson 1971). Juvenile Pacific ocean perch form ball-shaped schools near the surface or hide in rocks (NOAA 1990). Throughout its range, Pacific ocean perch is generally associated with gravel, rocky or boulder type substrate found in and along gullies, canyons, and submarine depressions of the upper continental slope (Ito 1986).

Pacific ocean perch winter and spawn in deeper water (>275 m), then move to feeding grounds in shallower water (180-220 m) in the summer (June-August) to allow gonads to ripen (Archibald et al. 1983, Gunderson 1971, NOAA 1990). Pacific ocean perch are slow-growing and long-lived. The maximum age has been estimated at about 90 years (ODFW, personal communication). Largest size is about 54 cm and 2 kg (Archibald et al. 1983, Beamish 1979, Eschmeyer et al. 1983, Ito 1986, Mulligan & Leaman 1992, NOAA 1990, Richards 1994). Pacific ocean perch are carnivorous. Larvae eat small zooplankton. Small juveniles eat copepods, and larger juveniles feed on euphausiids. Adults eat euphausiids, shrimps, squids, and small fishes. Immature fish feed throughout the year, but adults feed only seasonally, mostly April-August (NOAA 1990). Predators of Pacific ocean perch include sablefish and Pacific halibut.

Shortbelly rockfish (*Sebastes jordani*) are found from San Benito Islands, Baja California, Mexico to La Perouse Bank, British Columbia (Eschmeyer et al 1983, Lenarz 1980). The habitat of the shortbelly rockfish is wide ranging (Eschmeyer et al 1983). Shortbelly rockfish inhabit waters from 50-350 m in depth (Allen & Smith 1988) on the continental shelf (Chess et al. 1988) and upper-slope (Stull & Tang 1996). Adults commonly form very large schools over smooth bottom near the shelf break (Lenarz 1992). Shortbelly rockfish have also been observed along the Monterey Canyon ledge (Sullivan 1995). During the day shortbelly rockfish are found near the bottom in dense aggregations. At night they are more dispersed. (Chess et al 1988). During the summer shortbelly rockfish tend to move into deeper waters and to the north as they grow, but they do not make long return migrations to the south in the winter to spawn (Lenarz 1980).

Shortbelly rockfish are viviparous, bearing advanced yolk-sac larvae (Ralston et al 1996). Shortbelly rockfish spawn off California during January through April (Lenarz 1992). Larvae metamorphose to juveniles at 27 mm and appear to begin forming schools at the surface at that time (Laidig et al. 1991, Lenarz 1980). A few shortbelly rockfish mature at age 2, while 50% are mature at age 3 and nearly all are mature by age 4 (Lenarz 1992). They live to be about 10 years old (Lenarz 1980, MacGregor 1986) with the maximum recorded age being 22 years (Lenarz 1992).

Shortbelly rockfish feed primarily on various life stages of euphausiids and calanoid copepods both during the day and night (Chess et al. 1988, Lenarz et al. 1991). Shortbelly rockfish play a key role in the food chain, as they are preyed upon by chinook and coho salmon, lingcod, black rockfish, hake, bocaccio, chilipepper, pigeon guillemots, western gull, marine mammals, and others (Chess et al. 1988, Eschmeyer et al. 1983, Hobson & Howard 1989, Lenarz 1980).

Widow rockfish (*Sebastes entomelas*) range from Albatross Bank of Kodiak Island to Todos Santos Bay, Baja California (Eschmeyer et al. 1983, Laroche & Richardson 1981, Miller & Lea 1972, NOAA 1990). Widow rockfish occur over hard bottoms along the continental shelf (NOAA 1990) Widow rockfish prefer rocky banks, seamounts, ridges near canyons, headlands, and muddy bottoms near rocks. Large widow rockfish concentrations occur off headlands such as Cape Blanco, Cape Mendocino, Pt. Reyes, and Pt. Sur. Adults form dense, irregular, midwater and semi-demersal schools deeper than 100 m at night and disperse during the day (Eschmeyer et al. 1983, NOAA 1990, Wilkins 1986). All life stages are pelagic, but older juveniles and adults are often associated with the bottom (NOAA 1990). All life stages are fairly common from Washington to California (NOAA 1990). Pelagic larvae and juveniles co-occur with yellowtail rockfish, chilipepper, shortbelly rockfish, and bocaccio larvae and juveniles off central California (Reilly et al 1992).

Widow rockfish are viviparous, have internal fertilization, and brood their eggs until released as larvae (NOAA 1990, Ralston et al 1996, Reilly et al 1992). Mating occurs from late fall-early winter. Larval

release occurs from December-February off California, and from February-March off Oregon. Juveniles are 21-31 mm at metamorphosis, and they grow to 25-26 cm over 3 years. Age and size at sexual maturity varies by region and sex, generally increasing northward and at older ages and larger sizes for females. Some mature in 3 years (25-26 cm), 50% are mature by 4-5 years (25-35 cm), and most are mature in 8 years (39-40 cm) (Barss & Wyllie-Echeverria 1987, NOAA 1990). The maximum age of widow rockfish is 28 years, but rarely over 20 years for females and 15 years for males (NOAA 1990). The largest size is 53 cm, about 2.1 kg (Eschmeyer et al. 1983, NOAA 1990).

Widow rockfish are carnivorous. Adults feed on small pelagic crustaceans, midwater fishes (such as age-1 or younger Pacific hake), salps, caridean shrimp, and small squids (Adams 1987, NOAA 1990). During spring, the most important prey item is salps, during the fall fish are more important, and during the winter widow rockfish primarily eat sergestid shrimp (Adams 1987). Feeding is most intense in the spring after spawning (NOAA 1990). Pelagic juveniles are opportunistic feeders and their prey consists of various life stages of calanoid copepods, and euphausiids (Reilly et al. 1992).

Canary Rockfish (*Sebastes pinniger*) are found between Cape Colnett, Baja California, and southeastern Alaska (Boehlert 1980, Boehlert & Kappenman 1980, Hart 1973, Love 1991,Miller & Lea 1972, Richardson & Laroche 1979). There is a major population concentration of canary rockfish off Oregon (Richardson & Laroche 1979). Canary primarily inhabit waters 91-183 m deep (Boehlert & Kappenman 1980). In general, canary rockfish inhabit shallow water when they are young and deep water as adults (Mason 1995). Adult canary rockfish are associated with pinnacles and sharp drop-offs (Love 1991). Canary rockfish are most abundant above hard bottoms (Boehlert & Kappenman 1980). In the southern part of its range, the canary rockfish appears to be a reef-associated species (Boehlert 1980). In central California, newly settled canary rockfish are first observed seaward of the sand-rock interface and farther seaward in deeper water (18-24 m).

Canary rockfish are ovoviviparous and have internal fertilization (Boehlert & Kappenman 1980, Richardson & Laroche 1979). Off California, canary rockfish spawn from November-March and from January-March off Oregon and, Washington, (Hart 1973, Love 1991, Richardson & Laroche 1979). The age of 50% maturity of canary rockfish is 9 years; nearly all are mature by age 13 . The maximum length canary rockfish grow to is 76 cm (Boehlert & Kappenman 1980, Hart 1973, Love 1991). Canary rockfish primarily prey on planktonic creatures, such as krill, and occasionally on fish (Love 1991). Canary rockfish feeding increases during the spring-summer upwelling period when euphausiids are the dominant prey and the frequency of empty stomachs is lower (Boehlert et al. 1989).

Chilipepper rockfish (*Sebastes goodei*) are found from Magdalena Bay, Baja California, to as far north as the northwest coast of Vancouver Island, British Columbia (Allen & Smith 1988, Hart 1973, Miller & Lea 1972). Chilipepper have been taken as deep as 425 m, but nearly all in survey catches were taken between 50 and 350 m (Allen & Smith 1988). Adults and older juveniles usually occur over the shelf and slope; larvae and small juveniles are generally found near the surface. In California, chilipepper are most commonly found associated with deep, high relief rocky areas and along cliff drop-offs (Love et al. 1990), as well as on sand and mud bottoms (MBC 1987). They are occasionally found over flat, hard substrates (Love et al. 1990). Love (1981) does not consider this to be a migratory species. Chilipepper may migrate as far as 45 m off the bottom during the day to feed (Love 1981).

Chilipeppers are ovoviviparous, and eggs are fertilized internally (Reilly et al. 1992). Chilipepper school by sex just prior to spawning (MBC 1987). In California, fertilization of eggs begins in October ands spawning occurs from September to April (Oda 1992) with the peak being December to January (Love et al. 1990). Chilipepper may spawn multiple broods in a single season (Love et al. 1990). Females of the species are notably larger, reaching lengths of up to 56 cm (Hart 1973). Males are usually smaller than 40 cm (Dark & Wilkins 1994). Males mature at 2 to 6 years of age and 50% are mature at 3 to 4 years. Females mature at 2 to 5 years with 50% mature at 3 to 4 years (MBC 1987). Females may attain an age of about 27 years whereas the maximum age for males is about 12 years (MBC 1987).

Larval and juvenile chilipepper eat all life stages of copepods and euphausiids, and are considered to be somewhat opportunistic feeders (Reilly et al. 1992). In California, adults prey on large euphausiids, squid, and small fishes such as anchovies, lanternfish and young hake (Hart 1973, Love et al. 1990). Chilipepper are found with widow rockfish, greenspotted rockfish, and swordspine rockfish (Love et al. 1990). Juvenile chilipepper compete for food with bocaccio, yellowtail rockfish, and shortbelly rockfish (Reilly et al. 1992).

Bocaccio rockfish (*Sebastes paucispinis*) are found in the Gulf of Alaska off Krozoff and Kodiak Islands, south as far as Sacramento Reef, Baja California (Hart 1973, Miller & Lea 1972). In survey catches, Allen and Smith (1988) found bocaccio to be most common at 100-150 m over the outer continental shelf. Sakuma and Ralston (1995) categorized bocaccio as both a nearshore and offshore species. Larvae and small juveniles are pelagic (Garrison & Miller 1982) and are commonly found in the upper 100 m of the water column, often far from shore (MBC 1987). Large juveniles and adults are semi-demersal and are most often found in shallow coastal waters over rocky bottoms associated with algae (Sakuma & Ralston). Adults are commonly found in eelgrass beds, or congregated around floating kelp beds (Love et al. 1990, Sakuma & Ralston). Young and adult bocaccio also occur around artificial structures, such as piers and oil platforms (MBC 1987). Although juveniles and adults are usually found around vertical relief, adult aggregations also occur over firm sand-mud bottoms (MBC 1987). Bocaccio move into shallow waters during their first year of life (Hart 1973), then move into deeper water with increased size and age (Garrison & Miller 1982).

Bocaccio are ovoviviparous (Garrison & Miller 1982, Hart 1973). Love et al. (1990) reported the spawning season to be protracted and to last almost year-round (>10 months). Parturition occurs during January to April off Washington, November to March off northern and central California, and October to March off southern California (MBC 1987). Two or more broods may be born in a year in California (Love et al. 1990). The spawning season is not well known in northern waters. Males mature at 3 to 7 years with 50% mature in 4 to 5 years. Females mature at 3 to 8 years with 50% mature in 4 to 6 years (MBC 1987).

Larval bocaccio often eat diatoms, dinoflagellates, tintinnids, and cladocerans (Sumida & Moser 1984). Copepods and euphausiids of all life stages (adults, nauplii and egg masses) are common prey for juveniles (Sumida & Moser 1984). Adults eat small fishes associated with kelp beds, including other species of rockfishes, and occasionally small amounts of shellfish (Sumida & Moser 1984). Bocaccio are eaten by sharks, salmon, other rockfishes, lingcod and albacore, as well as sea lions, porpoises, and whales (MBC 1987). Bocaccio directly compete with chilipepper and widow, yellowtail, and shortbelly rockfishes for both food and habitat resources (Reilly et al. 1992).

Splitnose rockfish (*Sebastes diploproa*) occur from Prince William Sound, Alaska to San Martin Island, Baja California (Miller & Lea 1972). Splitnose rockfish occur from 0-800 m, with most of survey catches occurring in depths of 100-450 m (Allen & Smith 1988). The relative abundance of juveniles (<21 cm) is quite high in the 91-272 m depth zone and then decreases sharply in the 274-475 m depth zone (Boehlert 1980). Splitnose rockfish have a pelagic larval stage and prejuvenile stage, and a benthic juvenile stage (Boehlert 1977). Benthic splitnose rockfish associate with mud habitats (Boehlert 1980). Young occur in shallow water, often at the surface under drifting kelp (Eschmeyer et al. 1983). The major types of vegetation that juveniles are found under are Fucus sp. (dominant), eelgrass, and bull kelp (Schaffer et al 1995). Juvenile splitnose rockfish off southern California are the dominant rockfish species found under drifting kelp (Boehlert 1977).

Splitnose are ovoviviparous and release yolk sac larvae (Boehlert 1977). They may have two parturition seasons, or may possibly release larvae throughout the year (Boehlert 1977). In general, the main parturition season get progressively shorter and later toward the north (Boehlert 1977). Splitnose rockfish growth rates vary with latitude, being generally faster in the north. Splitnose mean sizes increase with depth in a given latitudinal area. Mean lengths of females are generally greater than males (Boehlert 1980). Off California, 50% maturity occurs at 21 cm, or 5 years of age, whereas off British Columbia 50% of males and females are mature at 27 cm (Hart 1973). Adults can achieve a maximum size of 46 cm

(Boehlert 1980, Eschmeyer et al. 1983, Hart 1973). As estimated from otolith readings, females have surface ages to 55 years and section ages to 81 years.

Adult splitnose rockfish off southern California feed on midwater plankton, primarily euphausiids (Allen 1982). Juveniles feed mainly on planktonic organisms, including copepods and cladocerans during June and August. In October, their diets shift to larger epiphytic prey and are dominated by a single amphipod species. Juvenile splitnose rockfish actively select prey (Schaffer et al. 1995) and are probably diurnally active (Allen 1982). Adults are probably nocturnally active, at least in part (Allen 1982).

Yellowtail rockfish (*Sebastes flavidus*) range from San Diego, California, to Kodiak Island, Alaska (Fraidenburg 1980, Gotshall 1981, Lorz et al. 1983, Love 1991, Miller & Lea 1972, Norton & MacFarlane 1995). The center of yellowtail rockfish abundance is from Oregon to British Columbia (Fraidenburg 1980). Yellowtail rockfish are a common, demersal species abundant over the middle shelf (Carlson 1972, Fraidenburg 1980, Tagert 1991, Weinberg 1994). Yellowtail rockfish are most common near the bottom, but not on the bottom (Love 1991, Stanley et al. 1994). Yellowtail adults are considered semi-pelagic (Stanely et al. 1994, Stein et al. 1992) or pelagic which allows them to range over wider areas than benthic rockfish (Pearcy 1992). Adult yellowtail rockfish occur along steeply sloping shores or above rocky reefs (Hart 1973). They can be found above mud with cobble, boulder and rock ridges, and sand habitats; they are not, however, found on mud, mud with boulder, or flat rock (Love 1991, Stein et al. 1992). Yellowtail rockfish form large (sometimes greater than 1,000 fish) schools and can be found alone or in association with other rockfishes (Love 1991, Pearcy 1992, Rosenthal et al. 1982, Stein et al. 1992, Tagert 1991). These schools may persist at the same location for many years (Pearcy 1992).

Yellowtail rockfish are viviparous (Norton & MacFarlane 1995) and mate from October to December. Parturition peaks in February and March and from November-March off California (Westrheim 1975). Young-of-the-year pelagic juveniles often appear in kelp beds beginning in April and live in and around kelp, in midwater during the day, descending to the bottom at night (Love 1991, Tagert 1991). Male yellowtail rockfish are 34-41 cm in length (5-9 years) at 50% maturity, females are 37-45 cm (6-10 years) (Tagert 1991). Yellowtail rockfish are long-lived and slow-growing; the oldest recorded was 64 years old (Fraidenburg 1981, Tagert 1991). Even though they are slow growing, like other rockfish, they have a high growth rate when compared to other rockfish (Tagert 1991). They reach a maximum size of about 55 cm in approximately 15 years (Tagert 1991). Yellowtail rockfish feed mainly on pelagic animals, but are opportunistic, occasionally eating benthic animals as well (Lorz et al. 1983). Large juveniles and adults eat fish (small hake, Pacific herring, smelt, anchovies, lanternfishes, and others), along with squid, krill, and other planktonic organisms (euphausiids, salps, and pyrosomes) (Love 1991, Phillips 1964, Rosenthal et al. 1982, Tagert 1991).

Shortspine Thornyhead (*Sebastolobus alascanus*) are found from northern Baja California to the Bering Sea and occasionally to the Commander Islands north of Japan (Jacobson & Vetter 1996). They are common from southern California northward (Love 1991). Shortspine thornyhead inhabit areas over the continental shelf and slope (Erickson & Pikitch 1993, Wakefield & Smith 1990). Although they can occur as shallow as 26 m (Eschmeyer et al. 1983), shortspine thornyhead mainly occur between 100 and 1400 m off Oregon and California, most commonly between 100-1000 m (Jacobson & Vetter 1996).

Spawning occurs in February and March off California (Wakefield & Smith 1990). Shortspine thornyhead are thought to be oviparous (Wakefield & Smith 1990), although there is no clear evidence to substantiate this (Erickson & Pikitch 1993). Eggs rise to the surface to develop and hatch. Larvae are pelagic for about 12-15 months. During January to June, juveniles settle onto the continental shelf and then move into deeper water as they become adults (Jacobson & Vetter 1996). Off California, they begin to mature at 5 years; 50% are mature by 12-13 years; and all are mature by 28 years (Owen & Jacobson 1992). Although it is difficult to determine the age of older individuals, Owen and Jacobson (1992) report that off California, they may live to over 100 years of age. The mean size of shortspine thornyhead increases with depth and is greatest at 1000-1400 m (Jacobson & Vetter 1996).

Benthic individuals are sit-and-wait predators that rest on the bottom and remain motionless for extended periods of time (Jacobson & Vetter 1996). Off Alaska, shortspine thornyhead eat a variety of invertebrates such as shrimps, crabs, and amphipods, as well as fishes and worms (Owen & Jacobson 1992). Longspine thornyhead are a common item found in the stomachs of shortspine thornyhead. Cannibalism of newly settled juveniles is important in the life history of thornyheads (Jacobson & Vetter 1996).

Longspine Thornyhead (*Sebastolobus altivelis*) are found from the southern tip of Baja California to the Aleutian Islands (Eschmeyer et al. 1983, Jacobson & Vetter 1996, Love 1991, Miller & Lea 1972, Smith & Brown 1983) but are abundant from southern California northward (Love 1991). Juvenile and adult longspine thornyhead are demersal and occupy the sediment surface (Smith & Brown 1983). Off Oregon and California, longspine thornyhead mainly occur at depths of 400-1400+ m, most between 600 and 1000 m in the oxygen minimum zone (Jacobson & Vetter 1996). Thornyhead larvae (Sebastolobus spp.) have been taken in research surveys up to 560 km off the California coast (Cross 1987, Moser et al. 1993). Juveniles settle on the continental slope at about 600-1200 m (Jacobson & Vetter 1996). Longspine thornyhead live on soft bottoms, preferably sand or mud (Eschmeyer et al. 1983, Jacobson & Vetter 1996, Love 1991). Longspine thornyheads neither school nor aggregate (Jacobson & Vetter 1996).

Spawning occurs in February and March at 600-1000 m (Jacobson & Vetter 1996, Wakefield & Smith 1990). Longspine thornyhead are oviparous and are multiple spawners, spawning 2-4 batches per season (Love 1991, Wakefield & Smith 1990). Eggs rise to the surface to develop and hatch. Floating egg masses can be seen at the surface in March, April, and May (Wakefield & Smith 1990). Juveniles (<5.1 cm long) occur in midwater (Eschmeyer et al. 1983). After settling, longspine thornyhead are completely benthic (Jacobson & Vetter 1996). Longspine thornyhead can grow to 38 cm (Eschmeyer et al. 1983, Jacobson & Vetter 1996, Miller & Lea 1972) and live more than 40 years (Jacobson & Vetter 1996). Longspine thornyhead reach the onset of sexual maturity at 17-19 cm TL (10% of females mature) and 90% are mature by 25-27 cm (Jacobson & Vetter 1996).

Longspine thornyhead are sit-and-wait predators (Jacobson & Vetter 1996). They consume fish fragments, crustaceans, bivalves, and polychaetes and occupy a tertiary consumer level in the food web. Pelagic juveniles prey largely on herbivorous euphausiids and occupy a secondary consumer level in the food web (Love 1991, Smith & Brown 1983). Longspine thornyhead are commonly seen in shortspine thornyhead stomachs. Cannibalism in newly settled longspine thornyhead may occur because juveniles settle directly onto adult habitat (Jacobson & Vetter 1996). Sablefish commonly prey on longspine thornyhead.

Darkblotched rockfish (*Sebastes crameri*) are found from Santa Catalina Island off southern California to the Bering Sea (Miller & Lea 1972, Richardson & Laroche 1979). Off Oregon, Washington, and British Columbia, it is primarily an outer shelf/upper slope species (Richardson & Laroche 1979). Distinct population groups have been found off the Oregon coast between lat. 44 30' and 45 20'N (Richardson & Laroche 1979). Adults occur in depths of 25-600 m and 95% are between 50 and 400 m (Allen & Smith 1988). Off central California, young darkblotched rockfish recruit to soft substrate and low (<1 m) relief reefs (Love et al. 1991). Darkblotched rockfish make limited migrations after they have recruited to the adult stock (Gunderson 1997).

Darkblotched rockfish are viviparous (Nichol & Pickitch 1994). Insemination of female darkblotched rockfish occurs from August to December, fertilization and parturition occurs from December to March off Oregon and California, primarily in February off Oregon and Washington (Hart 1973, Nichol & Pickitch 1994, Richardson & Laroche 1979). Females attain 50% maturity at a greater size (36.5 cm) and age (8.4 years) than males (29.6 cm and 5.1 years) (Nichol & Pickitch 1994). Adults can grow to 57 cm (Hart 1973). Pelagic young are food for albacore (Hart 1973).

Yelloweye rockfish (*Sebastes ruberrimus*) range from the Aleutian Islands, Alaska to northern Baja California; they are common from central California northward to the Gulf of Alaska (Eschmeyer et al. 1983, Hart 1973, Love 1991, Miller & Lea 1972, O'Connell & Funk 1986). Yelloweye rockfish occur in water 25-550 m deep; 95% of survey catches occurred from 50 to 400 m (Allen & Smith 1988). Yelloweye

rockfish are bottom dwelling, generally solitary, rocky reef fish, found either on or just over reefs (Eschmeyer et al. 1983, Love 1991, O'Connell & Funk 1986). Boulder areas in deep water (>180 m) are the most densely-populated habitat type and juveniles prefer shallow-zone broken-rock habitat (O'Connell & Carlile 1993). They also reportedly occur around steep cliffs and offshore pinnacles (Rosenthal et al. 1982). The presence of refuge spaces is an important factor affecting their occurrence (O'Connell & Carlile 1993).

Yelloweye rockfish are ovoviviparous and give birth to live young in June off Washington (Hart 1973). The age of first maturity is estimated at 6 years and all are estimated to be mature by 8 years (Echeverria 1987). Yelloweye rockfish can grow to 91 cm (Eschmeyer et al. 1983, Hart 1973). Males and females probably grow at the same rates (Love 1991, O'Connell & Funk 1986). The growth rate of yelloweye rockfish levels off at approximately 30 years of age (O'Connell & Funk 1986). Yelloweye rockfish can live to be 114 years old (Love 1991, O'Connell & Funk 1986). Yelloweye rockfish are a large predatory reef fish that usually feeds close to the bottom (Rosenthal et al. 1988). They have a widely varied diet, including fish, crabs, shrimps and snails, rockfish, cods, sand lances and herring (Love 1991). Yelloweyes have been observed underwater capturing smaller rockfish with rapid bursts of speed and agility. Off Oregon the major food items of the yelloweye rockfish include cancroid crabs, cottids, righteye flounders, adult rockfishes, and pandalid shrimps (Steiner 1978). Quillback and yelloweye rockfish have many trophic features in common (Rosenthal et al. 1988).

Cowcod (Sebastes levis) occur from Ranger Bank and Guadalupe Island, Baja California to Usal, Mendocino County, California (Miller & Lea 1972). Cowcod range from 21 to 366 m (Miller & Lea 1972) and is considered to be parademersal (transitional between a midwater pelagic and benthic species). Adults are commonly found at depths of 180-235 m and juveniles are most often found in 30-149 m of water (Love et al. 1990). MacGregor (MacGregor 1986) found that larval cowcod are almost exclusively found in southern California and may occur many miles offshore. Adult cowcod are primarily found over high relief rocky areas (Allen 1982); they are generally solitary, but occasionally aggregate (Love et al. 1990). Solitary subadult cowcod have been found in association with large white sea anemones on outfall pipes in Santa Monica Bay (Allen 1982). Juveniles occur over sandy bottom and solitary ones have been observed resting within a few centimeters of soft-bottom areas where gravel or other low relief was found (Allen 1982). Although the cowcod is generally not migratory; it may move to some extent to follow food (Love 1980). Cowcod are ovoviviparous, and large females may produce up to three broods per season (Love et al. 1990). Spawning peaks in January in the Southern California Bight (MacGregor 1986). Cowcod grow to 94 cm (Allen 1982). Larvae are extruded at about 5.0 mm (MacGregor 1986). Juveniles eat shrimp and crabs and adults eat fish, octopus, and squid (Allen 1982).

Bank rockfish (*Sebastes rufus*) are found from Newport, Oregon, to central Baja California, most commonly from Fort Bragg southward (Love 1992). Bank rockfish occur offshore (Eschmeyer et al. 1983) from depths of 31 to 247 m (Love 1992), although adults prefer depths over 210 m (Love et al. 1990). Observations of commercial catches indicate juveniles occupy the shallower part of the species range (Love et al. 1990). Bank rockfish are a midwater, aggregating species that is found over hard bottom (Love 1992), over high relief or on bank edges (Love et al. 1990), and along the ledge of Monterey Canyon (Sullivan 1995). It also frequents deep water over muddy or sandy bottom (Miller & Lea 1972). Spawning ranges from December to May (Love et al. 1990). Peak spawning in the Southern California Bight is January, in central and northern California it is February. Off California, bank rockfish are multiple brooders (Love et al. 1990). Females grow to a larger maximum size (50 cm) than males (44 cm), but grow at a slightly slower rate (Cailliet et al. 1996). Males reach first maturity at 28 cm, 50% maturity at 31 cm, and 100% at 38 cm. Females reach first maturity at 31 cm, 50% at 36 cm, and 100% maturity at 39 cm (Love et al. 1990). Bank rockfish are midwater feeders, eating mostly gelatinous planktonic organisms such as tunicates, but also preying on small fishes and krill (Love 1992).

Black rockfish (*Sebastes melanops*) are found from southern California (San Miguel Island) to the Aleutian Islands (Amchitka Island), and they occur most commonly from San Francisco northward (Hart 1973, Miller & Lea 1972, Phillips 1957, Stein & Hassler 1989). Black rockfish occur from the surface to greater

than 366 m, however they are most abundant at depths less than 54 m (Stein & Hassler 1989). Off California, black rockfish are found along with the blue, olive, kelp, black-and-yellow, and gopher rockfishes (Hallacher & Roberts 1985) Adults are usually observed well up in the water column (Hallacher & Roberts 1985). The abundance of black rockfish in shallow water declines in the winter and increases in the summer (Stein & Hassler 1989). Densities of black rockfish decrease with depth during both the upwelling and non-upwelling seasons (Hallacher & Roberts 1985, PFMC 1996). Off Oregon larger fish seem to be found in deeper water (20-50 m) (Stein & Hassler 1989). Black rockfish off the northern Washington coast and outer Strait of Juan de Fuca exhibit no significant movement. However, fish appear to move from the central Washington coast southward to the Columbia River, but not into waters off Oregon. Movement displayed by black rockfish off the northern Oregon coast is primarily northward to the Columbia River (Culver 1986). Black rockfish form mixed sex, midwater schools, especially in shallow water (Hart 1973, Stein & Hassler 1989). Black rockfish larvae and young juveniles (<40-50 mm) are pelagic but are benthic at larger sizes (Laroche & Richardson 1980).

Black rockfish have internal fertilization and annual spawning (Stein & Hassler 1989). Parturition occurs from February-April off British Columbia, January-March off Oregon, and January-May off California (Stein & Hassler 1989). Spawning areas are unknown, but spawning may occur in offshore waters because gravid females have been caught well offshore (Dunn & Hitz 1969, Hart 1973, Stein & Hassler 1989). Black rockfish can live to be more than 20 years in age. The maximum length attained by the black rockfish is 60 cm (Hart 1973, Stein & Hassler 1989). Off Oregon, black rockfish primarily prey on pelagic nekton (anchovies and smelt) and zooplankton such as salps, mysids, and crab megalops. Off central California, juveniles eat copepods and zoea, while adults prey on juvenile rockfish, euphausiids, and amphipods during upwelling periods; during periods without upwelling they primarily consume invertebrates. Black rockfish feed almost exclusively in the water column (Culver 1986). Black rockfish are known to be eaten by lingcod and yelloweye rockfish (Stein & Hassler 1989).

Blackgill rockfish (Sebastes melanostomus) are distributed from Washington to Punta Abreojos (Love 1991, Moser & Ahlstom 1978). Adult blackgill rockfish are found offshore at depths of 219-768 m (Eschmeyer et al. 1983). Blackgill rockfish usually inhabit rocky or hard bottom habitats, along steep drop-offs, such as the edges of submarine canyons and over seamounts (Love 1991). However, they may also occur over soft-bottoms (Eschmeyer et al. 1983). Blackgill rockfish are a transitional species, occupying both midwater and benthic habitats (Love et al. 1990), although they are rarely taken at more than 9 m above the bottom (Love 1991). Blackgill are considered an aggregating species (Love 1991).

Blackgill rockfish spawn from January-June (peaking in February) off southern California, and in February off central and northern California (Love 1991, Love et al. 1990, Moser & Ahlstom 1978). The largest blackgill rockfish on record is 61 cm (Eschmeyer et al. 1983, Love 1991, Love et al. 1990). Blackgill rockfish primarily prey on such planktonic prey as euphausids and pelagic tunicates, as well as small fishes (e.g., juvenile rockfishes and hake, anchovies and lantern fishes) and squid (Love et al. 1990).

Redstripe rockfish (Sebastes proriger) occur from San Diego, California to the Bering Sea (Allen & Smith 1988, Hart 1973, Miller & Lea 1972). Redstripe rockfish inhabits the outer shelf and upper slope and are most common between 100 and 350 m (Allen & Smith 1988). Adults are semi-demersal, while larvae and juveniles are pelagic to semi-demersal (Garrison & Miller 1982). Young redstripe rockfish can occur in estuaries (Kendall & Lenarz 1986). Redstripe rockfish are generally found slightly off the bottom over both high and low relief rocky areas (Starr et al. 1996). Redstripe rockfish are very sedentary, exhibiting little or no movement from a home habitat or range (Matthes et al. 1986).

Redstripe rockfish are ovoviviparous (Garrison & Miller 1982). Off Oregon, larvae are released between April and July, but later off northern and central California, during July through September (Kendall & Lenarz 1986). Redstripe rockfish may grow to reach 61 cm (Hart 1973). Larvae and juveniles of this species were found to feed primarily on copepods, their eggs, and copepod nauplii, as well as all stages of euphausiids (Kendall & Lenarz 1986). Food of adult redstripe rockfish consists of small fish such as anchovies, herring and early stages of other groundfish, as well as squid (Starr et al. 1996). Redstripe

rockfish may compete for food and habitat resources with widow, squarespot, shortbelly, and canary rockfishes, as well as lingcod and spiny dogfish (Erickson et al. 1991).

Sharpchin rockfish (Sebastes zacentrus) occur from San Diego, California, to the Aleutian Islands, Alaska (Allen & Smith 1988). Sharpchin rockfish occur from 25 to 475 m, but about 96% occur from 100 to 350 m (Allen & Smith 1988). Sharpchin rockfish can occur over soft bottoms (Eschmeyer et al. 1983), but they apparently prefer mud and cobble substrate and are associated with boulder and cobble fields (Stein et al. 1992). Parturition occurs from March through July off Oregon and from May through June off northern and central California (Echeverria 1987). Shortraker rockfish can grow to 33 cm (Miller & Lea 1972).

Silvergrey Rockfish (Sebastes brevispinis) are found from Santa Barbara Island, southern California, to the Bering Sea (Allen & Smith 1988, Hart 1973). Silvergray rockfish are included in the shelf rockfish assemblage (Hart 1973, Nagtegaal 1983) and inhabit the outer shelf-mesobenthal zone (Allen & Smith 1988). They occur in depths from 0 to 375 m with 95% of survey catches taken in depths of 100 to 300 m (Allen & Smith 1988). Off Oregon, young are probably released in late spring or summer (Hart 1973, Allen & Smith 1988). Off Washington, young are released in June (Hart 1973). They achieve a maximum size of 71 cm (Hart 1973).

Yellowmouth rockfish (Sebastes reedi) occur from Sitka, Alaska to Point Arena, California. Yellowmouth rockfish occupy a depth range from 137-366 m (Miller & Lea 1972) usually 275-366 m over rough bottom (Kramer et al. 1995). Off Oregon, yellowmouth rockfish release their young from February through June (Kendall & Lenarz 1986). Yellowmouth females mature at 33 cm or larger (9 years old), and males mature at lengths greater than 31 cm (9 years old). They grow to 54 cm and can live to 34 years of age (Hart 1973).

"Other Rockfish" are those rockfish species that do not have individual ABC/OYs. Life history descriptions of these species may be found in the Essential Fish Habitat West Coast Groundfish which was prepared for Amendment 11 to the FMP. This document may be requested from the Council office or is available online at http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html

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3.2.4 Endangered Species

West Coast marine species listed as endangered or threatened under the Endangered Species Act (ESA) are discussed below in sections 3.2.5 (Marine Mammals,) 3.2.6 (Seabirds,) 3.2.7 (Sea Turtles,) and 3.2.8 (Salmon). Under the ESA, a species is listed as "endangered" if it is in danger of extinction throughout a significant portion of its range and "threatened" if it is likely to become an endangered species within the foreseeable future throughout all, or a significant portion, of its range. The following species are subject to the conservation and management requirements of the ESA:

Table 3.2.3 West Coast Endangered Species
Marine Mammals
Threatened: • Steller sea lion (*Eumetopias jubatus*) Eastern Stock, • Guadalupe fur seal (*Arctocephalus townsendi*), and • Southern sea otter (*Enhydra lutris*) California Stock.
Seabirds
Endangered: • Short-tail albatross (*Phoebastria (=Diomedea) albatrus*), • California brown pelican (*Pelecanus occidentalis*), and • California least tern (*Sterna antillarum browni*). Threatened: • Marbled murrelet (*Brachyramphs marmoratus*).
Sea Turtles
Endangered: • Green turtle (*Chelonia mydas*) • Leatherback turtle (*Dermochelys coriacea*) • Olive ridley turtle (*Lepidochelys olivacea*) Threatened: • Loggerhead turtle (*caretta*)
Salmon
Endangered: • Chinook salmon (*Oncorhynchus tshawytscha)* Sacramento River Winter; Upper Columbia Spring • Sockeye salmon (*Oncorhynchus nerka)* Snake River • Steelhead trout (*Oncorhynchus mykiss)* Southern California; Upper Columbia Threatened: • Coho salmon (*Oncorhynchus kisutch)* Central California, Southern Oregon, and Northern California Coasts • Chinook salmon (*Oncorhynchus tshawytscha*) Snake River Fall, Spring, and Summer; Puget Sound; Lower Columbia; Upper Willamette; Central Valley Spring; California Coastal • Chum salmon (*Oncorhynchus keta)* Hood Canal Summer; Columbia River • Sockeye salmon (*Oncorhynchus nerka)* Ozette Lake • Steelhead trout (*Oncorhynchus mykiss)* South-Central California, Central California Coast, Snake River Basin, Lower Columbia, California Central Valley, Upper Willamette, Middle Columbia, Northern California

3.2.5 Marine Mammals

The waters off Washington, Oregon, and California (WOC) support a wide variety of marine mammals. Approximately thirty species, including seals and sea lions, sea otters, and whales, dolphins, and porpoise, occur within the EEZ. Many marine mammal species seasonally migrate through West Coast waters, while others are year round residents.

There is limited information documenting the interactions of groundfish fisheries and marine mammals, but marine mammals are probably affected by many aspects of groundfish fisheries. The incidental take of marine mammals, defined as any serious injury or mortality resulting from commercial fishing operations, is reported to NMFS by vessel operators. In the West Coast groundfish fisheries, incidental take is

infrequent and primarily occurs in trawl fisheries (Forney *et al.* 2000). Indirect effects of groundfish fisheries on marine mammals are more difficult to quantify due to a lack of behavioral and ecological information about marine mammals. However, marine mammals may be affected by increased noise in the oceans, change in prey availability, habitat changes due to fishing gear, vessel traffic in and around important habitat (i.e., areas used for foraging, breeding, raising offspring, or hauling-out), at-sea garbage dumping, and diesel or oil discharged into the water associated with commercial fisheries.

The Marine Mammal Protection Act (MMPA) and the ESA are the federal legislation that guide marine mammal species protection and conservation policy. Under the MMPA on the West Coast, NMFS is responsible for the management of cetaceans and pinnipeds, while the U.S. Fish and Wildlife Service (FWS) manages sea otters. Stock assessment reports review new information every year for strategic stocks (those whose human-caused mortality and injury exceeds the potential biological removal [PBR]) and every three years for non-strategic stocks. Marine mammals whose abundance falls below the optimum sustainable population (OSP) are listed as "depleted" according to the MMPA.

Fisheries that interact with species listed as depleted, threatened, or endangered may be subject to management restrictions under the MMPA and ESA. NMFS publishes an annual list of fisheries in the Federal Register separating commercial fisheries into one of three categories, based on the level of serious injury and mortality of marine mammals occurring incidentally in that fishery. The categorization of a fishery in the list of fisheries determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. The WOC groundfish fisheries are in Category III, indicating a remote likelihood of, or no known serious injuries or mortalities, to marine mammals.

Of the marine mammal species incidentally caught in WOC groundfish fisheries, the Steller sea lion is listed as threatened under the ESA, the northern elephant seal may be within their OSP range, and there is insufficient data to determine the status of the harbor seal, California sea lion, Dall's porpoise, and Pacific white-sided dolphin relative to their OSP. None of these species are classified as strategic stocks under the MMPA. Based on its Category III status, the incidental take of marine mammals in the WOC groundfish fisheries does not significantly impact marine mammal stocks.

3.2.6 Seabirds

Over sixty species of seabirds occur in waters off the coast of WOC within the EEZ. These species include: loons, grebes, albatross, fulmars, petrels, shearwaters, storm-petrels, pelicans, cormorants, frigate birds, phalaropes, skuas, jaegers, gulls, kittiwakes, skimmers, terns, guillemots, murrelets, auklets, and puffins. The migratory range of these species includes commercial fishing areas; fishing also occurs near the breeding colonies of many of these species.

Interactions between seabirds and fishing operations are wide-spread and have led to conservation concerns in many fisheries throughout the world. Abundant food in the form of offal (discarded fish and fish processing waste) and bait attract birds to fishing vessels. Of the gear used in the groundfish fisheries on the West Coast, seabirds are occasionally taken incidentally by trawl and pot gear, but they are most often taken by longline gear. Around longline vessels, seabirds forage for offal and bait that has fallen off hooks at or near the water's surface and are attracted to baited hooks near the water's surface during the setting of gear. If a bird becomes hooked while feeding on bait or offal, it can be dragged underwater and drowned. Of the incidental catch of seabirds by longline groundfish fisheries in Alaska, northern fulmars represented about 66% of the total estimated catch of all bird species, gulls contributed 18%, Laysan albatross 5%, and black-footed albatross about 4% (Stehn *et al.* 2001). Longline gear and fishing strategies in Alaska are similar to some, but not all, of those used in WOC longline fisheries.

Besides entanglement in fishing gear, seabirds may be indirectly affected by commercial fisheries in various ways. Change in prey availability may be linked to directed fishing and the discarding of fish and offal. Vessel traffic may affect seabirds when it occurs in and around important foraging and breeding

habitat and increases the likelihood of bird storms. In addition, seabirds may be exposed to at-sea garbage dumping and the diesel and oil discharged into the water associated with commercial fisheries. The FWS is the primary federal agency responsible for seabird conservation and management. Under the Magnuson-Stevens Act, NMFS is required to ensure fishery management actions comply with other laws designed to protect seabirds.

3.2.7 Sea Turtles

Sea turtles are highly migratory; four of the six species found in U.S. waters have been sighted off the West Coast. Little is known about the interactions between sea turtles and West Coast commercial fisheries. The directed fishing for sea turtles in WOC groundfish fisheries is prohibited, because of their ESA listings, but the incidental take of sea turtles by longline or trawl gear may occur. Sea turtles are known to be taken incidentally by the California-based pelagic longline fleet and the California halibut gillnet fishery. Because of differences in gear and fishing strategies between those fisheries and the WOC groundfish fisheries, the expected take of sea turtles by groundfish gear is minimal. The management and conservation of sea turtles is shared between NMFS and FWS.

Sea turtles may be also indirectly affected by commercial fisheries. Sea turtles are vulnerable to collisions with vessels and can be killed or injured when struck, especially if struck with an engaged propeller. Entanglement in abandoned fishing gear can also cause death or injury to sea turtles by drowning or loss of a limb. The discard of garbage at sea can be harmful for sea turtles, because the ingestion of such garbage may choke or poison them. Sea turtles have ingested plastic bags, beverage six-pack rings, styrofoam, and other items commonly found aboard fishing vessels. The accidental discharge of diesel and oil from fishing vessels may also put sea turtles at risk, as they are sensitive to chemical contaminates in the water.

3.2.8 Salmon

Salmon caught in the U.S. West Coast fishery have life cycle ranges that include coastal streams and river systems from central California to Alaska and oceanic waters along the U.S. and Canada seaward into the north central Pacific Ocean, including Canadian territorial waters and the high seas. Some of the more critical portions of these ranges are the freshwater spawning grounds and migration routes.

Chinook or king salmon (*Oncorhynchus tshawytscha*) and coho or silver salmon (*O. kisutch*) are the main species caught in Council-managed ocean salmon fisheries. In odd-numbered years, catches of pink salmon (*O. gorbuscha*) can also be fairly large, primarily off Washington and Oregon. Ocean salmon are caught with commercial and recreational troll gear. No other gears are allowed to take and retain salmon in the ocean fisheries. Small amounts of rockfish and other groundfish are taken as incidental catch in salmon troll fisheries.

NMFS issued Biological Opinions under the ESA on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999 pertaining to the effects of the groundfish fishery on chinook salmon (Puget Sound, Snake River spring/summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central Valley, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal, Oregon coastal), chum salmon (Hood Canal, Columbia River), sockeye salmon (Snake River, Ozette Lake), and steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, northern California, southern California).

3.2.9 Nongroundfish Species Interactions

Coastal Pelagic Species (CPS) CPS are schooling fish, not associated with the ocean bottom, that migrate in coastal waters. These species include: northern anchovy (*Engraulis mordax*), Pacific sardine

(*Sardinops sagax*), Pacific (chub) mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*) and market squid (*Loligo opalescens*). These species are managed under the Coastal Pelagic Species Fishery Management Plan.

Sardines inhabit coastal subtropical and temperate waters and at times have been the most abundant fish species in the California current. During times of high abundance, Pacific sardine range from the tip of Baja California to southeastern Alaska. When abundance is low, Pacific sardine do not occur in large quantities north of Point Conception, California. Pacific (chub) mackerel in the northeastern Pacific range from Banderas Bay, Mexico to southeastern Alaska. They are common from Monterey Bay, California to Cabo San Lucas, Baja California, and most abundant south of Point Conception, California. The central subpopulation of northern anchovy ranges from San Francisco, California to Punta Baja, Mexico. Jack mackerel are a pelagic schooling fish that range widely throughout the northeastern Pacific, however much of their range lies outside the U.S. EEZ. Adult and juvenile market squid are distributed throughout the Alaska and California current systems, but are most abundant between Punta Eugenio, Baja California and Monterey Bay, Central California.

CPS are taken incidentally in the groundfish fishery. Incidental take is well documented in the at-sea and shore-based whiting fishery. Preliminary data for 2001 indicates approximately 321mt of jack mackerel, 469 mt of Pacific mackerel, and 55 mt of squid was incidentally taken in the at-sea whiting fishery. There is little information on the incidental take of CPS by the other segments of the fishery, however given CPS are not associated with the ocean bottom, the interaction is expected to be minimal.

Dungeness Crab The Dungeness crab (*Cancer magister*) is distributed from the Aleutian Islands, Alaska, to Monterey Bay, California. They live in bays, inlets, around estuaries, and on the continental shelf. Dungeness crab are found to a depth of about 180 m. Although it is found at times on mud and gravel, this crab is most abundant on sand bottoms; frequently it occurs among eelgrass. The Dungeness crab, which are typically harvested using traps (crab pots), ring nets, by hand (scuba divers) or dip nets, are incidentally taken or harmed by groundfish gears.

Pacific Pink Shrimp Pacific pink shrimp (*Pandalus jordani*) are found from Unalaska in the Aleutian Islands to San Diego, California, at depths of 25 to 200 fm (46 to 366 m). Off the U.S. West Coast these shrimp are harvested with trawl gear from northern Washington to central California between 60 and 100 fm (110 to 180 m). The majority of the catch is taken off the coast of Oregon. Concentrations of pink shrimp are associated with well-defined areas of green mud and muddy-sand bottom. Shrimp trawl nets are usually constructed with net mesh sizes smaller than the net mesh sizes for legal groundfish trawl gear. Thus, it is shrimp trawlers that commonly take groundfish in association with shrimp, rather than the reverse.

Pacific Halibut Halibut (*Hippoglossus stenolepis*) belong to a family of flounders called Pleuronectidae. Halibut are usually found in deep water (40 to 200 m). The International Pacific Halibut Commission (IPHC) report, "Incidental Catch and Mortality of Pacific Halibut, 1962-2000" contains estimates of the incidental catches of halibut in the coastal trawl fisheries (groundfish and shrimp trawls). Estimates of incidental catches of halibut, based on the at-sea observer data collected in the Enhanced Data Collection Program conducted from 1995 through 1998, results in an estimated mortality level of legal-sized halibut incidentally taken in shrimp and groundfish trawl fisheries was 254 mt (560,000 pounds) in 2002.

Forage Fish Forage fish are small, schooling fish that serve as an important source of food for other fish species, birds and marine mammals. Examples of forage fish species are herring (*Clupea harengus pallasi*), smelt (*Osmeridae*), anchovies, and sardine. Many species of fish feed on forage fish. Major predators of herring include Pacific cod (42% of diet), whiting (32%), lingcod (71%), halibut (53%), coho (58%), and chinook salmon (58%) (Environment Canada 1994). Many species of seabirds depend heavily on forage fish for food as well. Marine mammals consuming forage fish include: harbor seals, California sea lions, Stellar sea lions, harbor porpoises, Dall's porpoises, and Minke whales (Calambokidis and Baird 1994). Forage fish are most commonly found in nearshore waters and within bays and estuaries, although

some do spend of their lives in the open ocean where they may be incidentally taken by groundfish gears, particularly in trawls. Preliminary data from the 2002 at-sea whiting fishery indicates the fishery encounters very minor amounts of forage fish species (Pacific herring less than 1 mt and less than 1 mt of smelt and sardines combined). There is little information on the incidental take of forage fish by the other segments of the fishery, however given they are not associated with the ocean bottom, the interaction is expected to be minimal.

Miscellaneous Species Little information is available on nongroundfish species incidentally captured in the groundfish fishery. Other than those species mentioned above, documentation from the whiting fishery indicates species such as American shad and walleye pollock are taken incidentally. American shad, introduced in 1885, have flourished throughout the lower Columbia River, producing a record run of 2.2 million fish in 1988 (ODFW and WDFW 1989). American shad was also taken in the shore-based whiting fishery. Walleye pollock are found in the waters of the Northeastern Pacific Ocean from the Sea of Japan, north to the Sea of Okhotsk, east in the Bering Sea and Gulf of Alaska, and south in the Northwestern Pacific Ocean along the Canadian and U.S. West Coast to Carmel, California.

3.3 HUMAN ENVIRONMENT

3.3.1 History of Management Via Annual Specifications and Management Measures

Washington, Oregon, and California have been managing groundfish fisheries off of their coasts since the early 20th century. Then, as now, many fisheries straddled state borders, with vessels operating offshore of their home states and offshore of neighboring states. Congress recognized the West Coast need for a coordinating body that would ensure compatible management and regulation between states in 1947 by forming the Pacific States Marine Fisheries Commission (PSMFC). Since then, PSMFC has served in a coordinating role for fisheries management issues in common between the three West Coast states, Alaska, and Idaho. The Fishery Conservation and Management Act (now amended and renamed as the Magnuson-Stevens Fishery Conservation and Management Act) went into effect in 1977, extending exclusive economic zones (EEZs) out to 200 nautical miles offshore and forming fishery management councils to manage the fisheries occurring within EEZ waters. From 1977 through 1982, the three states coordinated groundfish management through the Pacific Fishery Management Council (Council,) during which time the Council also developed its initial FMP for groundfish (Council, March 1998).

In September 1982, the groundfish FMP went into effect. Under the FMP, the Council was authorized to set annual optimum yields (OYs) for Pacific whiting, Pacific ocean perch (POP,) shortbelly rockfish, widow rockfish, and sablefish. These particular species were the first chosen for OY harvest limitations due to their contributions to foreign catch (Pacific whiting and shortbelly rockfish) or to their importance to domestic harvest (sablefish and widow rockfish.) In the case of POP, which had been overfished by the foreign fisheries in the 1960s and 1970s, an OY was needed to set the species on a rebuilding schedule. Federal groundfish fishery regulations intended to keep the harvest of these species within their OYs and of other groundfish within their Acceptable Biological Catches (ABCs) were relatively brief and simple. These regulations were published in the *Federal Register*, to be modified if and when the fisheries approached an ABC or OY for a managed species.

By 1987, the Council had realized that its relatively simple and straightforward FMP was too inflexible to allow regular adjustments to harvest levels and regulatory restrictions. For example, the FMP had to be amended each time the Council wished to set an OY for a species that had not previously been managed with OYs. Amendment 4 to the FMP was intended to address some of the inefficiencies of the initial FMP by creating processes by which the Council would discuss and make decisions on long-term permanent changes to regulations, on annual specifications of ABCs and OYs and management measures to implement those specifications, and on inseason actions to change the annual management measures. Amendment 4 gave the FMP a new procedure for developing and implementing annual specifications and their allocations between different fishery sectors:

> "The Council will develop preliminary recommendations at the first of two meetings (usually in September) based upon the best stock assessment information available to the Council at the time and consideration of public comment. After the first meeting, the Council will provide a summary of its preliminary recommendations and their basis to the public through its mailing list as well as providing copies of the information at the Council office and to the public upon request. The Council will notify the public of its intent to develop final recommendations at its second meeting (usually November) and solicit public comment both before and at its second meeting.
>
> At its second meeting, the Council will again consider the best available stock assessment information which should be contained in the recently completed SAFE (Stock Assessment and Fishery Evaluation) report and consider public testimony before adopting final recommendations to the Secretary (of Commerce.) Following the second meeting, the Council will submit its recommendations along with the rationale and supporting information to the Secretary for review and implementation.
>
> Upon receipt of the Council's recommendations, supporting rationale and information, the Secretary will review the submission and, if approved, publish a notice in the *Federal Register* making the Council's recommendations effective January 1 of the upcoming fishing year." (Council, August 1990)

The Council used this "two-meeting process" followed by the publication of a single *Federal Register* notice to implement the Council's recommendations from 1991-2001. Through that process, the Council could set harvest levels (such as ABCs and OYs) for managed species and management measures intended to allow the fisheries to achieve those harvest levels (trip limits or bag limits, size limits, etc.) Overall federal regulations were amended to include a list of species that could be managed via the annual process and the particular management measures that could be used with those species, called the "routine" management measures. Over time, the Council added new species and new management measures to this list by amending federal regulations when new routine measures were needed.

For both commercial and recreational fisheries, routine management measures have been intended to keep groundfish landings within annual harvest levels. In the commercial fisheries, trip landing and frequency limits were applied as routine management measures for the following reasons: to extend the fishing season; to minimize disruption of traditional fishing and marketing patterns; to reduce discards; to discourage target fishing while allowing small incidental catches to be landed; to allow small fisheries to operate outside the normal season; and, for the open access fishery only, to keep landings at the historical proportions of the 1984-88 window period. Size limits were applied as routine management measures in the commercial fisheries, either to protect juvenile fish or to extend the fishing season. For the recreational fisheries, bag limits have been applied as routine management measures to spread the available catch over a large number of anglers, to avoid waste, or for consistency with state regulations. Size limits were also applied as routine management measures in the recreational fisheries, either to protect juvenile fish, to enhance the quality of the recreational fishing experience, or for consistency with state regulations. (FMP at 6.2.1)

With Amendment 13 to the FMP, the Council set up a two-meeting process for designating new routine management measures that set publication of the routine management measures in its annual SAFE document, rather than in federal regulations. The Council built this additional flexibility into the FMP so that it could act more swiftly on new information about management changes needed to protect overfished species. Under the Amendment 13 revisions to the FMP, routine management measures could be added or changed, "in cases where protection of an overfished or depleted stock is required..." (FMP at 6.2) Amendment 13 also added to the types of routine management measures available to the Council, "In cases where protection of an overfished or depleted stock is required, the Council may impose limits that differ by gear type, or establish closed areas or seasons."

Table 3.3.1 Management Measures Classified as Routine, as of January 2002

Commercial fisheries:	Recreational fisheries:
• Differential limits by gear type may be set for overfished species or for fisheries in which overfished species are caught incidentally. • For all FMP-managed rockfish species, whether individually or within a species group/complex, trip landing and frequency limits may be set. Off California, time/area closures may be set. • For all FMP-managed flatfish species, whether individually or within a species group/complex, trip landing and frequency limits may be set. • For cowcod, time/area closures may be set. • For sablefish and lingcod, trip landing and and frequency limits and size limits may be set. And, for lingcod, time/area closures may be set. • For whiting, trip landing and frequency limits may be set for the offseason. Directed whiting season start dates may be set. • For all groundfish species, separately or in any combination, trip landing and frequency limits may be set for any open access fishery, including exempted trawl fisheries.	• For lingcod off Washington, and Oregon, bag limits, size limits, and closed seasons may be set. For lingcod, cabezon, and kelp greenling off California, bag limits, size limits, boat limits, hook limits, closed areas, and dressing/fileting requirements may be set. • For rockfish off Washington and Oregon, bag limits and size limits may be set. For rockfish off California, bag limits, size limits, boat limits, hook limits, closed areas, and dressing/fileting requirements may be set.

In 2001, NMFS was challenged on the two-meeting annual specifications and management measures process in Natural Resources Defense Council, Inc. v. Evans, 2001 168 F.Supp. 2d 1149 (N.D. Cal. 2001) Part of the court's ruling in that case required NMFS to provide a *Federal Register* notice-and-comment period as part of the annual specifications and management measures process. To meet the court's requirement for the 2002 specifications and management measures, NMFS published a proposed (67 FR 1555, January 11, 2002) and final rule (67 FR 10490, March 7, 2001) for the overall 2002 specifications and management measures, and an emergency rule to implement management measures for January-February 2002 (67 FR 1540, January 11, 2002). If the agency had not published January-February management measures for 2002, the management measures from January-February 2001 would have remained in effect for that period. NMFS published the emergency rule for the first two months of 2002 because some of the management measures from January-February 2001 were not conservative enough to adequately address rebuilding needs of overfished species. For the 2003 specifications and management measures, the Council will develop its initial specifications and management measures recommendations at its June 2002 meeting, with final recommendations at its September 2002 meeting, to be followed by a NMFS proposed and final rule for the 2003 season.

Protecting Overfished Species Within the Specifications and Management Measures Process
The major goal of management of the groundfish fishery throughout the 1990's was to prevent overfishing while achieving the OYs and providing year-round fisheries for the major species or species groups. One of the primary goals of the Pacific coast groundfish FMP is to keep the fishery open throughout the entire year for most segments of the fishery (See FMP goals and objectives at section 2.0). Harvest rates are constrained by annual harvest guidelines, two-month or one-month cumulative period landings limits, individual trip limits, size limits, species-to-species ratio restrictions, bag limits in the recreational fisheries and other measures, all designed to control effort so that the allowable catch is taken at a slow rate that will stretch the season out to a full year. Cumulative period catch limits are set by comparing current or previous landings rates with the year's total available catch. Landings limits have been used to slow the pace of the fishery and stretch the fishing season out over as many months as possible, so that the overall harvest target is not reached until the end of the year.

By 2000, lower OYs and growing awareness of reduced productivity of the groundfish resource had made it apparent that the goal of a year-round fishery was no longer achievable for a number of species. In addition, new legislative mandates under the Magnuson-Stevens Act gave highest priority to preventing overfishing and rebuilding overfished stocks to their MSY levels. The National Standard Guidelines at 50 CFR 600.310 interpreted this as "weak stock management," which means that harvest of healthier stocks must be curtailed to prevent overfishing or to rebuild overfished stocks. To meet initial rebuilding requirements for the three species declared overfished in 1999, bocaccio, lingcod, and POP, the Council developed a new management strategy that diverts effort off the sea floor of the continental shelf, where

many of the overfished species are found. Overfished species protection measures initially applied in 2000 included more restrictive trip limits for continental shelf species, reduced seasons for commercial hook-and-line gear and recreational fisheries off central and southern California, and trawl gear restrictions limiting the species and quantities of groundfish that could be taken with trawl nets using footropes of greater than 8 inches in diameter.

These 2000 restrictions were relatively severe when compared against allowable landings limits in the 1990s. At the urging of their coastal communities, the governors of the three West Coast states asked the Secretary of Commerce, through NMFS, to declare the West Coast groundfish fishery a commercial fishery failure. At the time, NMFS estimated that allowable landings limits in 2000 would reduce the commercial harvest value of West Coast groundfish by 25% from 1999 harvest levels. NMFS did declare the groundfish fisheries to be a commercial fishery failure in January 2000 (Dalton, 2000). In its declaration, NMFS cited the potential causes of the fishery resource disaster to be declining productivity in groundfish stocks associated with recently discovered oceanic regime shifts, advancements in scientific information about West Coast rockfish productivity that showed West Coast rockfish stocks to be generally less productive than many similar rockfish species worldwide.

Since 2000, management measures intended to eliminate directed catch and minimize incidental catch of overfished species have increased in number and in restrictiveness. Although year-round groundfish landings opportunities continue to be available to some gears in some areas, fishing opportunities have been eliminated for many vessels.

Table 3.3.2: Timetable of management measures implemented to protect overfished species through the annual specifications and management measures process

Year	Species Declared Overfished	Management Measures to Protect Overfished Species (Implemented through Specifications and Management Measures)
1999	lingcod, bocaccio, POP	• These three species were declared overfished in March 1999, after the specifications and management measures had been set for that year.
2000	canary rockfish, cowcod (Management measures to protect lingcod, bocaccio, POP continue.)	• Targeting opportunities for overfished stocks eliminated • Shelf rockfish targeting reduced for hook-and-line gear and for large and small footrope trawl, particularly for healthy stocks closely associated with overfished species (e.g. chilipepper rockfish with bocaccio) • Commercial hook-and-line and recreational fisheries off central and southern California closed 4 months for nearshore and shelf rockfish with rockfish recreational bag limits also reduced • All commercial fisheries closed 6 months coastwide for lingcod with recreational season closures and reduced bag limits for lingcod varying by state.
2001	widow rockfish, darkblotched rockfish (Management measures to protect lingcod, bocaccio, POP, canary rockfish, cowcod continue.)	• Targeting opportunities for overfished stocks eliminated • Shelf rockfish targeting further reduced for hook-and-line gear and for large and small footrope trawl with minimal targeting allowed for midwater trawl gear • Flatfish landings restricted to reduce incidental catch of protected rockfish • Commercial hook-and-line and fisheries off California closed or depth restricted 7 months (central CA) or 5 months (southern CA) for nearshore and shelf rockfish • Recreational fisheries off California closed or depth restricted 6 months (central CA) or 4 months (southern CA) for nearshore and shelf rockfish with overall rockfish recreational bag limits same as in 2000 but species-specific limits reduced for overfished species • All commercial fisheries closed 6 months, except that central CA hook-and-line closed 8 months, for lingcod • Recreational season closures and continued reduced bag limits for lingcod varying by state • Cowcod Conservation Areas introduced to Southern California Bight waters, closed to all fishing for groundfish • Cowcod retention prohibited in all fisheries • Pink shrimp trawlers using fish excluder devices (state-managed fishery)

2002	yelloweye rockfish, whiting (Management measures to protect lingcod, bocaccio, POP, canary rockfish, cowcod, widow rockfish, darkblotched rockfish continue.)	• Targeting opportunities for all overfished stocks except whiting eliminated. Whiting OY reduced by 20% from 2001 • New bycatch analysis used to determine co-occurrence ratios between healthy species and overfished species, allowing more precise setting of healthy species limits to better reduce incidental catch of overfished species • Shelf rockfish targeting further reduced for hook-and-line gear and for all trawl gears • Flatfish landings further restricted to reduce incidental catch of protected rockfish • Commercial hook-and-line and recreational fisheries off California closed or depth restricted10 months (central CA) or 4 months (southern CA) for nearshore and shelf rockfish Commercial hook-and-line and recreational fisheries off central and southern California closed 4 months for nearshore and shelf rockfish with rockfish recreational bag limits also reduced • Commercial hook-and-line fisheries closed 6 months, except that central CA hook-and-line closed or depth restricted 8 months, for lingcod • Recreational season closures and continued reduced bag limits for lingcod varying by state • Cowcod Conservation Areas continue, cowcod retention continues to be prohibited • Yelloweye rockfish and canary rockfish retention prohibited in commercial hook-and-line fisheries, reduced or prohibited in recreational fisheries, reduced in trawl fisheries. • Pink shrimp trawlers using fish excluder devices (state-managed fishery) • Pacific halibut sport fishery closed area expanded to protect co-occurring yelloweye rockfish (state-managed fishery)

Figure 3.3.1

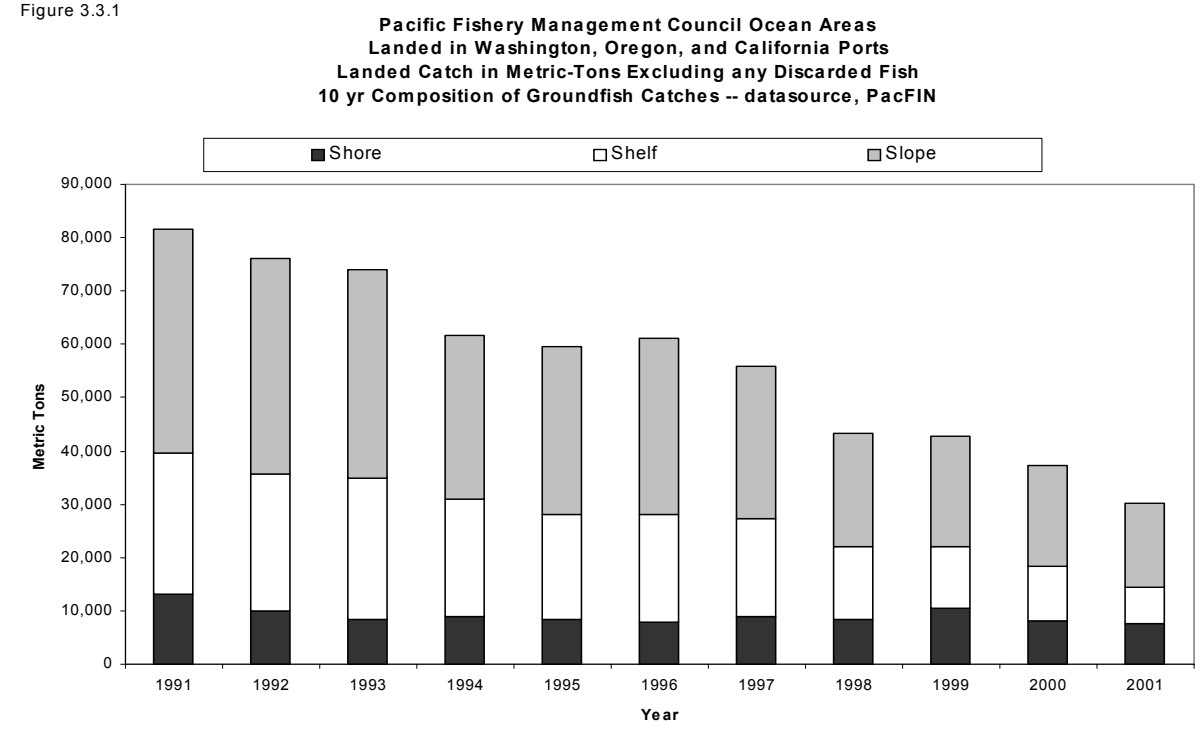
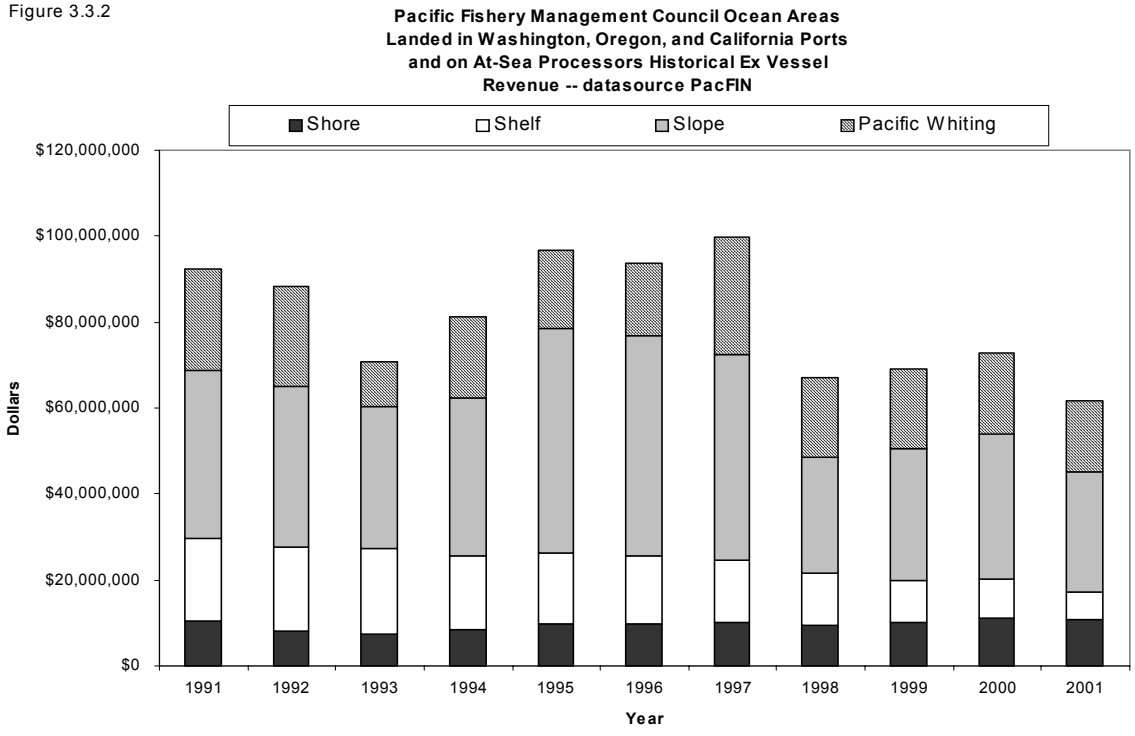


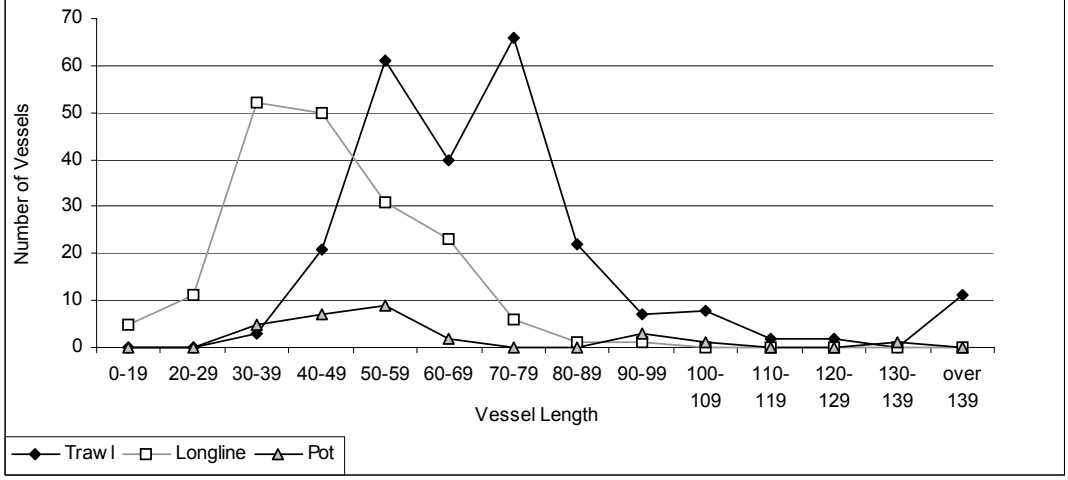
Figure 3.3.2



3.3.2 Profile of the Commercial Limited Entry (Non-Tribal) Groundfish Fisheries

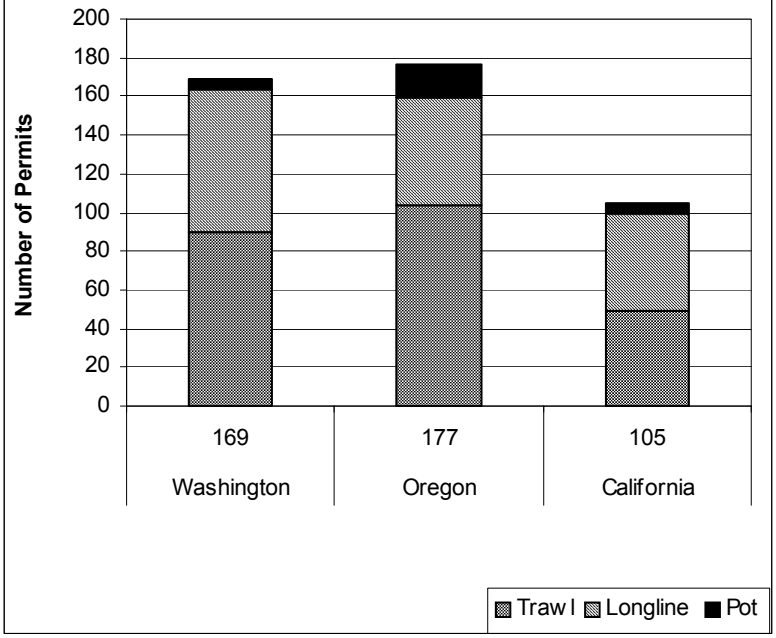
The Pacific coast groundfish fishery is a year-round, multi-species fishery that takes place off the coasts of Washington, Oregon, and California. Most of the Pacific coast non-tribal, commercial groundfish harvest is taken by the limited entry fleet. The groundfish limited entry program was established in 1994 for trawl, longline, and trap (or pot) gears. There are also several open access fisheries that take groundfish incidentally or in small amounts; participants in those fisheries may use, but are not limited to longline, vertical hook-and-line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl. Open access fisheries are described below at Section 3.3.3. In addition to these non-tribal commercial fisheries, members of the Makah, Quileute, Hoh, and Quinault tribes participate in commercial, and ceremonial and subsistence fisheries for groundfish off the Washington coast. Tribal groundfish fisheries are described below at Section 3.3.4.

Figure 3.3.3 Limited Entry Vessel Lengths, By Gear Type



In 1994, NMFS implemented Amendment 6 to the FMP, a license limitation program intended to restrict vessel participation in the directed commercial groundfish fisheries off Washington, Oregon, and California. The limited entry permits that were created through that program specify the gear type that a permitted vessel may use to participate in the limited entry fishery, and the vessel length associated with the permit. A vessel may only participate in the fishery with the gear designated on its permit(s) and may only be registered to a permit appropriate to the vessel's length. Since 1994, the Council has created further license restrictions for the limited entry fixed gear (longline and fishpot gear) fleet that restrict the number of permits useable in the primary sablefish fishery (Amendment 9) and that allow up to three

Figure 3.3.4 Limited Entry Permits, by State and Gear

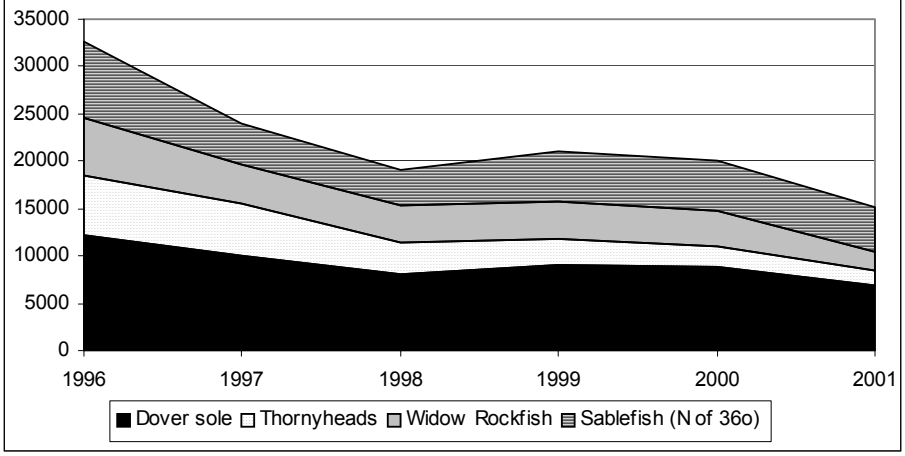


sablefish-endorsed permits to be used per vessel (Amendment 14.)

As of March, 2002, there were 450 vessels with Pacific Coast groundfish limited entry permits, of which approximately 54 percent were trawl vessels, 40 percent were longline vessels, and 6 percent were trap vessels. The number of vessels registered for use with limited entry permits has decreased since the 2001 implementation of the permit stacking program for sablefish-endorsed limited entry fixed gear permits. Of the approximately 164 sablefish-endorsed permits, 83 are held by vessels registered with more than one sablefish-endorsed permit. Of the vessels that are registered with multiple sablefish-endorsed permits, 25 are registered with two permits and 11 are registered with three permits.

Limited entry permits may be sold and leased out by their owners, so the distribution of permits between the three states often shifts. In 2002, roughly 23 percent of the limited entry permits were assigned to vessels making landings in California, 39 percent to vessels making landings in Oregon, and 37 percent to vessels making landings in Washington. In 1999, this division of permits was approximately 41 percent for California, 37 percent for Oregon, and 21 percent for Washington. This change in state distribution of limited entry permits may be due to the implementation of the permit stacking program. Vessels operating from northern ports may have purchased or leased sablefish-endorsed permits from vessels that had been operating out of California ports.

Figure 3.3.5 Groundfish Landings (Selected Species) 1996-2001, in metric tons



Limited entry fishers focus their efforts on many different species, with the largest landings by volume (other than Pacific whiting) from the following species: Dover sole, arrowtooth flounder, petrale sole, sablefish, thornyheads, and yellowtail rockfish. There are 55+ rockfish species managed by the Pacific coast groundfish FMP, of which seven species have been declared overfished in the past four years. Protective fisheries regulations intended to reduce the directed and incidental catch of overfished rockfish and other depleted species have notably reduced the harvest of rockfish in recent years, described at Table 3.3.2.

By weight, Pacific whiting represents the vast majority of West Coast groundfish landings. The whiting mid-water trawl fishery is a distinct component from the trawl groundfish trip limit fisheries. In 2001, whiting accounted for about 85 percent, by weight, of all commercial shore-based groundfish landings. Whiting is taken by treaty tribe catcher vessels delivering to a mothership (17.5% of total OY in 2002,) by non-tribal catcher vessels delivering to shore-based processing plants (42% of non-tribal OY,) by non-tribal catcher-vessels delivering to motherships (24% of non-tribal OY,) and by non-tribal catcher-processor vessels (34% of the non-tribal OY.) In 2001, 29 catcher vessels delivered whiting to shore-based processing plants. This number is down from previous years, when the number of participating vessels was in the mid- to upper-30s. Some vessels move between the West Coast and Alaska fisheries; some remain entirely off Washington, Oregon, and California. In 2001, the majority of whiting (about 73%) was landed in Oregon; Washington landings represented 24% of the total and California landings represented about 3.1%. Approximately 20 catcher vessels delivered to five motherships in 2001, and seven catcher-processor vessels participated in the whiting fishery. Also in 2001, four tribal catcher vessels delivered whiting to one mothership.

Figure 3.3.6a Groundfish Trawl Vessel Participation in Non-Groundfish Fisheries

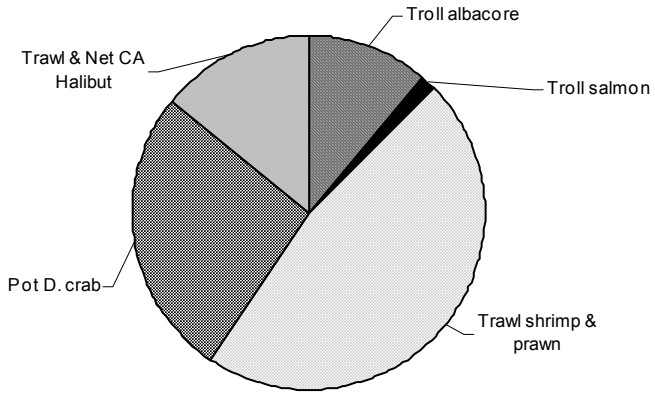


Figure 3.3.6b Groundfish Hook-and-Line (Includes Open Access) Vessel Participation in Non-Groundfish Fisheries

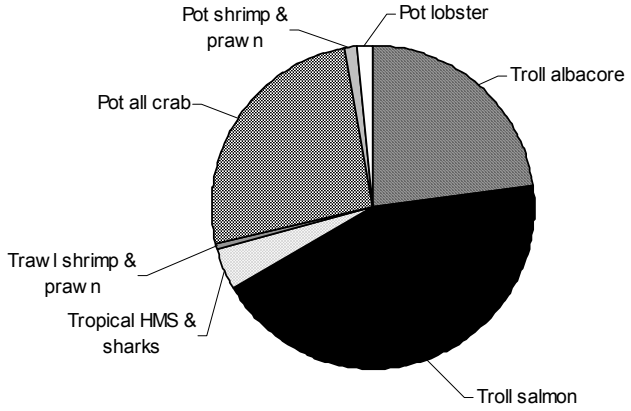
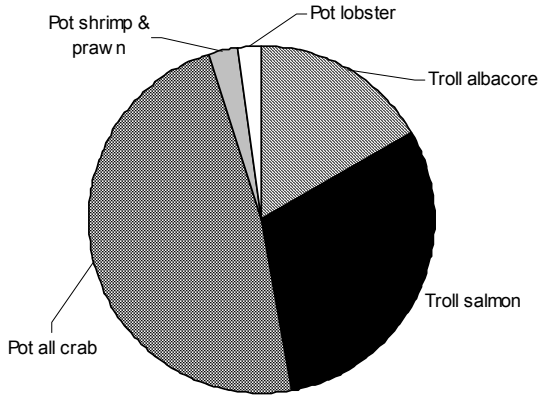


Figure 3.3.6c Groundfish Pot (Including Open Access) Vessel Participation in Non-Groundfish Fisheries



Catcher vessel owners and captains employ a variety of strategies to fill out a year of fishing. Fishers from the northern ports may fish in waters off of Alaska, as well as in the West Coast groundfish fishery. Others may change their operations throughout the year, targeting salmon, shrimp, crab, or albacore, in addition to various groundfish species, so as to spend more time in waters close to their communities. Factory trawlers and motherships fishing for or processing Pacific whiting off of the West Coast usually also participate in the Alaska pollock seasons, allowing the vessels and crews to spend a greater percentage of the year at work on the ocean. Commercial fisheries landings for species other than groundfish vary along the length of the coast. Dungeness crab landings are particularly high in Washington state, squid, anchovies, and other coastal pelagics figure heavily in California commercial landings, with salmon, shrimp, and highly migratory species like albacore more widely distributed, and varying from year to year.

Figures 3.3.6a-c show the approximate concentration of groundfish vessels in fisheries for non-groundfish West Coast species, 1994-1998. These pie charts exclude some non-groundfish fisheries where participation by groundfish vessels was so minimal that a viewer could not reasonably see the corresponding portion of the pie chart. Data for these charts came from an ongoing Council staff project to create a socio-economic profile of groundfish fishery participants.

It is clear from these three charts that there is some degree of gear loyalty for groundfish vessels participating in non-groundfish fisheries. For example, a notable proportion of the non-groundfish fishery participation by groundfish trawl vessels occurs in the shrimp and prawn trawl fisheries. Similarly, the hook-and-line groundfish fisheries show high participation in the troll albacore and troll salmon fisheries. And, while all three gear groups participate in pot fisheries for crab, groundfish pot vessels show the greatest percentage of gear group participation in pot fisheries for crab and other crustaceans.

3.3.3 Profile of the Commercial Open Access (Non-Tribal) Groundfish Fisheries, Directed and Incidental

Unlike the limited entry sector, the open access fishery has unrestricted participation and is comprised of vessels targeting or incidentally catching groundfish with a variety of gears, excluding groundfish trawl gear. While the open access groundfish fishery is under federal management and does not have participation restrictions, some state and federally managed fisheries that land groundfish in the open access fishery have implemented their own limited entry (restricted access) fisheries or enacted management provisions that have affected participation in groundfish fisheries.

The commercial open access groundfish fishery consists of vessels that do not necessarily depend on revenue from the fishery as a major source of income. Many vessels that predominately fish for other species inadvertently catch and land groundfish. Or, in times and areas when fisheries for other species are not profitable, some vessels will transition into the groundfish open access fishery for short periods. The commercial open access fishery for groundfish is split between vessels targeting groundfish (*directed fishery*) and vessels targeting other species (*incidental fishery*). The number of unique vessels targeting groundfish in the open access fishery between 1995-1998 coastwide was 2,723, while 2,024 unique vessels landed groundfish as incidental catch (1,231 of these vessels participated in both) (SSC's Economic Subcommittee, 2000).

In the directed open access fishery, fishers target groundfish in the "dead" and/or "live" fish fishery using a variety of gears. The terms dead and live fish fisheries refers to the state of the fish when they are landed. The dead fish fishery has historically been the most common way to land fish. The dead fish fishery made up 80% of the directed open access landings by weight coastwide in 2001. More recently, the market value for live fish has increased landings of live groundfish. The other component of the open access fishery is the incidental catch of groundfish in fisheries targeting other species (e.g., shrimp, salmon, highly migratory species, squid). Combining both the directed and incidental fisheries, the commercial groundfish open access fishery is potentially very large and includes a variety of gear types.

Landings, Revenue, and Participation by State Fisheries are generally distributed along the coast in patterns governed by factors such as location of target species, location of ports with supporting marine supplies and services, and restrictions/regulations of various state and federal governments. For the open access directed groundfish fishery, the majority of landings by weight that target groundfish occur off California. Oregon's directed groundfish open access fishery has the next highest landings, followed by Washington's. In the incidental groundfish fisheries, Oregon and California both have similar landings in their open access fisheries. Washington again has the lowest landings by weight of incidental groundfish (PFMC 2001e). Participation in "both directed and bycatch components of the open access fishery is much greater in California than in Oregon and Washington combined. For instance, in 1998, 779 California boats, 232 Oregon boats and 50 Washington boats participated in the directed fishery. In that same year, 520 California boats, 305 Oregon boats and 40 Washington boats participated in the bycatch fishery" (SSC's Economic Subcommittee, 2000).

Open access fisheries have been examined for their landings in the years 1996 and 2001, two randomly chosen years following the implementation of the limited entry program. Overall and in each individual state, open access landings decreased between 1996 and 2001. Federally, open access landings limits were sharply reduced between 1996 and 2001. Ex-vessel value for open access groundfish fisheries also decreased coastwide between 1996 and 2001. The directed fishery decreased from over $7 million in 1996 to under $5 million in 2001 and the incidental fishery decreased by half, from roughly $800,000 in 1996 to roughly $400,000 in 2001. (Goen & Hastie 2002)

Table 3.3.3: Estimated Open Access Fishery Landings in 1996 and 2001, by state, weight and value		
Open Access Sector	*1996 landings by weight*	*2001 landings by weight*
Coastwide Directed	3,291 mt	1,086 mt
Coastwide Incidental	802 mt	197 mt
Washington Directed	225 mt	66 mt
Washington Incidental	296 mt	28 mt
Oregon Directed	458 mt	237 mt
Oregon Incidental	384 mt	98 mt
California Directed	2,608 mt	776 mt
California Incidental	122 mt	70 mt

Directed Fishery The directed open access fishery for groundfish primarily targets rockfish, sablefish, lingcod, cabezon and flatfish. A vessel is considered to target groundfish in the open access fishery during a fishing trip if it is fishing with any gear other than groundfish trawl and if over 50% of the revenue from landings in that trip were from groundfish species. Participation in the directed fishery has decreased from 1,357 vessels in 1994 to 1,032 in 1999 (PFMC 2001). Reasons for this trend could include movement from the groundfish open access sector into other more profitable fisheries, or movement out of fishing all together.

As previously mentioned, the open access directed groundfish fishery consists of landings in both the dead and live fish categories. In the directed fishery, gears used to target and land dead groundfish include: vertical hook and line, rod/reel, pot, longline, troll/dinglebar, jig, sculpin trawl, setnet, and drifted (fly gear). Essentially all of the groundfish species managed under the FMP are targeted by various gears in the directed open access dead fishery. Increasingly, the live fish trade is gaining landings, due to a growing market value for live fish. In 2001, the live fish directed open access fishery accounted for 20% of the coastwide directed open access landings by weight, compared to only 6% in 1996. Gear used to target live groundfish include: pot, stick, and rod/reel. While Washington has prohibited live fish landings since 1999, both Oregon and California have live fish fisheries targeting groundfish. Currently, Oregon and California are drafting nearshore fishery management plans (FMPs) that could transition some species of groundfish landed in the live fish fishery from federal to state management.

In the directed open access fishery, certain gears are used to target specific species. Hook-and-line gear, the most common gear type, is generally used to target sablefish, rockfish and lingcod, while pot gear generally targets sablefish and some thornyheads and rockfish. In southern and central California, setnet gear targets rockfish, including chilipepper, widow, bocaccio, yellowtail and olive rockfish, and to a lesser extent vermillion rockfish.

Incidental Fisheries Fisheries that catch and land groundfish incidentally include: pink shrimp, spot prawn, ridgeback prawn, California and Pacific halibut, Dungeness crab, salmon, sea cucumber, coastal pelagic species, California sheephead, highly migratory species and the gillnet complex. Some of the gears in the incidental groundfish fishery include: non-groundfish trawl, pot, pole/line, longline, round haul, setnet, driftnet, purse seine, harpoon, gillnet, and troll. Not all of these fisheries have notable incidental groundfish catch. Open access fisheries with greater incidental groundfish catch are reviewed herein. For further information see Goen & Hastie, 2002, “Pacific Coast Groundfish Open Access Fishery Report, available from the Council.

Pink Shrimp Pink shrimp, also known as ocean shrimp, range from the Aleutian Islands in Alaska to San Diego, California, at depths from 150 to 1200 feet. They are targeted with shrimp trawl gear off

Washington, Oregon, and California. The pink shrimp fishery is managed by the states, with incidental catch limits imposed as trip limits in the federal open access groundfish fishery under "exempted trawl." Vessels targeting pink shrimp also land groundfish species, including rockfish, lingcod, sablefish, thornyheads, and flatfish. Between 1990 and 2001, coastwide landings of groundfish in the pink shrimp fishery reached a high in 1993 of 896 metric tons, 8 % of the total landing with shrimp (Goen & Hastie 2002). Many groundfish species are caught incidentally in the pink shrimp fishery due in part to the indiscriminate nature of trawl gear. Efforts are underway to reduce the incidence of groundfish bycatch, by requiring bycatch reduction devices (BRDs) and no-fishing buffer zones above the seafloor. In 2001, Washington and Oregon instituted mandatory BRDs in pink shrimp trawl nets, effective August 1, 2001, to reduce finfish take, including canary rockfish, an overfished species. Historically, about 71% of the canary rockfish landed annually by Pacific Coast shrimpers was landed in Oregon (ODFW 2002). As of 2003, all three states are requiring their pink shrimp trawlers to use BRDs to protect overfished groundfish species.

In Washington, 15 vessels participated in the pink shrimp fishery in 1998 and 14 on a regular basis in 1999. In Oregon, only 84 vessels landed shrimp in 2001 (74 double-rig; 10 single-rig) compared to 108 in 2000, 121 in 1999 and 109 vessels in 1998 (ODFW 2002, PSMFC 1997). Despite lower landings in recent years, Oregon generally has the largest volume by weight of landings. In 1999, Oregon landed more pink shrimp than California, Washington, British Columbia and Alaska combined. In California, an average of 88 vessels participated per season from 1983 through 1999 (Collier and Hannah 2001).

Pacific Halibut Pacific halibut range from the Hokkaido, Japan to the Gulf of Anadyr, Russia on the Asiatic Coast and from Nome, Alaska to Santa Barbara, California on the North American (Pacific) Coast. The Pacific halibut fishery is managed by the International Pacific Halibut Commission (IPHC) with implementing regulations set by the federal governments of Canada and the United States in their respective waters. A license from the IPHC is required to participate in the non-treaty commercial Pacific halibut fishery. The commercial sector off the Pacific Coast, IPHC Area 2A, has both a treaty and non-treaty sector. For the non-treaty commercial sector, harvest is divided between the directed halibut fishery and the incidental catch of halibut in the salmon troll fishery. When the Area 2A total allowable catch is above 900,000 lbs, as it has been in recent years, halibut may be retained in the limited entry primary sablefish fishery north of Point Chehalis, Washington (46˚53'18" N. lat.).

The non-treaty directed commercial fishery in Area 2A is confined to south of Point Chehalis, Washington, Oregon, and California. Area 2A licenses, issued for the directed commercial fishery, have decreased from 428 in 1997 to 320 in 2001. For 2001, the directed commercial licenses also allow longline vessels to retain halibut caught incidentally north of Point Chehalis during the primary sablefish season. Area 2A licenses issued for the incidental salmon troll fishery increased from 275 in 1997 to 345 in 2001. In Area 2A, the incidental salmon troll fishery was allowed to retain 1 halibut per 5 chinook, plus 1 extra halibut, with a maximum of 35 incidental halibut landed. Groundfish are caught in the Pacific halibut fishery coastwide. Rockfish and sablefish are commonly intercepted, as they are found in similar habitat to Pacific halibut and are easily caught with longline gear. The recent overfished species designation of yelloweye rockfish, which is commonly caught with Pacific halibut, led the Council to recommend area restrictions for both recreational and commercial halibut fisheries in 2003. NMFS is reviewing these recommendations for potential implementation by March 1, 2003, prior to the start of the 2003 Pacific halibut season.

Salmon Salmon are targeted with troll gear off all three West Coast states. The ocean commercial salmon fishery, both non-treaty and treaty, is under federal management with a suite of seasons and total allowable harvest. The Council manages commercial fisheries in the Exclusive Economic Zone (3-200 miles offshore), while the states manage commercial fisheries in state waters (0-3 miles). Beside troll gear, salmon are also targeted with gillnets and/or tanglenets in the mouths of rivers. Although the gillnet/tanglenet fishery does not technically occur in Council-managed waters, it may have some effect on groundfish that migrate through that area during part of their life cycle.

The majority of chinook and coho were landed in California in 1999 with Washington and Oregon both

having notably fewer landings. The salmon troll fishery does have an incidental catch of Pacific halibut and groundfish, including yellowtail rockfish. Halibut are caught incidentally off Washington and Oregon, while groundfish are caught off all three states. The California salmon fisheries primarily harvest chinook or king salmon. Coho or silver salmon are observed in small numbers but are presently under a no-retention catch policy. Occasionally in odd-numbered years, pink salmon are landed. In 1983, California implemented a limited entry program that capped the fishery at just over 4,600 commercial salmon vessels. Rockfish species taken with hook-and-line gear are susceptible to salmon troll gear. Yellowtail rockfish in particular have often bee landed with troll-caught salmon.

Gillnet Complex The gillnet or driftnet complex is managed by the state of California and made up of California halibut, white seabass, white croaker and sharks. These species are targeted solely with driftnet gear off California, since the setnet fishery for white seabass was prohibited in 1994. White seabass may also be caught with commercial hook-and-line gear in the early spring, when large seabass are available. White croaker, an abundant nearshore species, is predominately caught off central California in the driftnet fishery, although they range from Vancouver Island, British Columbia to Magdalena Bay, Baja California (but are not abundant north of Point Reyes, California). The entrance of Southeast Asian refugees (mainly Vietnamese) into this fishery, in part caused a shift in fishing effort from southern to central California (Moore and Wild 2001, p.234).

3.3.4 Profile of the Tribal Groundfish Fisheries, Directed and Incidental

In 1994, the U.S. government formally recognized that the four Washington Coastal Tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish, and concluded that, in general terms, the quantification of those rights is 50 percent of the harvestable surplus of groundfish available in the tribes' usual and accustomed (U and A) fishing areas (described at 60 CFR 660.324). West Coast treaty tribes have formal allocations for sablefish, black rockfish, and Pacific whiting. Members of the four coastal treaty tribes participate in commercial, ceremonial, and subsistence fisheries for groundfish off the Washington coast. Participants in the tribal commercial fisheries operate off Washington and use similar gear to non-tribal fishers. Groundfish caught in the tribal commercial fishery pass through the same markets as non-tribal commercial groundfish catch.

In 2002, tribal sablefish longline fisheries were allocated 10% of the total catch OY (436.7 mt) and then were discounted 3% of that allocation for discard mortality, for a landed catch allocation of 424 mt. For the commercial harvest of black rockfish off Washington State, the treaty tribes have a harvest guideline of: 20,000 lb (9,072 kg) north of Cape Alava (48°09'30" N. lat.) and 10,000 lb (4,536 kg) between Destruction Island (47°40'00" N. lat.) and Leadbetter Point (46°38'10" N. lat.). In 1999 and 2000 32,500 mt of whiting was set aside for treaty Indian tribes on the coast of Washington state, resulting in a commercial OY of 199,500 mt for 2000. In 2001 and 2002 the landed catch OY declined to 190,400 mt and 129,600 mt, respectively, and the tribal allocations for those years were also reduced to 27,500 mt and 22,680 mt, respectively.

There are several groundfish species taken in tribal fisheries for which the tribes have no formal allocations. For some species on which the tribes have a modest harvest, no specific allocation has been determined. Rather than try to reserve specific allocations of these species, the tribes annually recommend trip limits for these species to the Council that accommodate modest tribal fisheries. Tribal trip limits for groundfish species without tribal allocations are usually intended to constrain direct catch and incidental retention of overfished species in the tribal groundfish fisheries.

The bulk of tribal groundfish landings occur during the March-April halibut and sablefish fisheries. Most continental shelf species taken in the tribal groundfish fisheries are taken during the halibut fisheries and most slope species are similarly taken during the tribal sablefish fisheries. Approximately one-third of the tribal sablefish allocation is taken during an open competition fishery, in which member vessels from the sablefish tribes all have access to this portion of the overall tribal sablefish allocation. The open competition portion tends to be taken during the same period as the major tribal commercial halibut

fisheries in March and April. The remaining two-thirds of the tribal sablefish allocation are split between the sablefish tribes according to a mutually agreed-upon allocation scheme. Tribe-specific sablefish allocations are managed by the individual sablefish tribes, beginning in March and lasting into the autumn, depending on vessel participation management measures used. Participants in the halibut and sablefish fisheries tend to use hook-and-line gear, as required by the International Pacific Halibut Commission.

In addition to these hook-and-line fisheries, the Makah tribe annually harvests a whiting allocation using mid-water trawl gear. Since 1996, a portion of the U.S. whiting OY has been allocated to the Pacific Coast treaty tribes. The tribal allocation is subtracted from the whiting OY before allocation to the nontribal sectors. Since 1999, the tribal allocation has been based on a framework that is a sliding scale related to the U.S. whiting OY. To date, only the Makah tribe has fished on the tribal whiting allocation.

Table 3.3.4 Tribal Framework for Whiting Allocation, Adopted in 1999	
U.S. Optimum Yield	Tribal Allocation
Up to 145,000 mt	17.5% of the U.S. OY
145,001 mt to 175,000 mt	25,000 mt
175,001 mt to 200,000 mt	27,500 mt
200,001 mt to 225,000 mt	30,000 mt
225,001 mt to 250,000 mt	32,500 mt
Over 250,000 mt	35,000 mt

Makah vessels fit with mid-water trawl gear have also been targeting widow and yellowtail rockfish with mid-water gear in recent years.

Table 3.3.5 Treaty Tribe Groundfish Landings, 1995-2001. In pounds, except for whiting, which is in mt.

Species	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*
Lingcod	2,162	1,616	1,555	3,477	4,086	4,054	6,757
Rockfish (general)	110,673	38,105	48,969	54,638	41,379	32,827	131
Rockfish (red)	211	137	87	619	1,067	431	2,141
Widow Rockfish					73	2,012	8,445
Yellowtail Rockfish	734	1,087	2,528	10,370	29,281	71,124	150,254
Shortspine thornyhead	15,476	7,408	12,483	4,916	7,984	8,705	11,008
Sablefish	1,177,704	1,128,795	1,078,875	634,512	812,511	958,490	907,399
Whiting (in metric tons)		15,000	24,840	24,509	25,844	6,251	6,080

Twelve western Washington tribes possess and exercise treaty fishing rights to halibut, including the four tribes that possess treaty fishing rights to groundfish. Specific halibut allocations for the treaty Indian tribes began in 1986. The tribes did not harvest their full allocation until 1989, when the tribal fleet had developed to the point that it could harvest the entire Area 2A TAC. In 1993, judicial confirmation of treaty halibut rights occurred and treaty entitlement was established at 50 percent of the harvestable surplus of

halibut in the tribes' combined U&A fishing grounds. In 2000, the courts ordered an adjustment to the halibut allocation for 2000-2007, to account for reductions in the tribal halibut allocation from 1989-1993. For 2000 through 2007, the non-tribal fisheries will be transferring at least 25,000 lb per year to the tribal fisheries, for a total of 200,000 lb to be transferred to the tribal fisheries over that period. Tribal allocations are divided into a tribal commercial component and the year-round ceremonial and subsistence (C&S) component.

Tribal commercial halibut fisheries start at the same time as Alaskan and Canadian commercial halibut fisheries, generally in mid-March. The tribal halibut allocation is divided so that approximately 80–85% of allocation is taken in brief open competition derbies, in which vessels from all halibut tribes compete against each other for landings. In 2002, three of these "unrestricted" openings were held in the spring: a 48-hour opening on March 18th, a 24-hour opening on April 2nd, and a 36-hour opening on April 30th. In addition to these unrestricted openings, 15-20% of the tribal halibut allocation is reserved for "restricted" fisheries, in which participating vessels are restricted to a per trip and per day poundage limit for halibut. Two restricted opening opportunities were available in 2002, from March 20th through April 19th and from May 5th through 9th. Similar to the unrestricted openings, these restricted openings are available for vessels from all halibut tribes.

Table 3.3.6 Treaty Tribe Halibut Allocations and Catches, Dressed Weight, 1992-2001

Year	Commercial Allocation	Commercial Catch	C & S Allocation	C & S Catch
1992	152,500	154,200	10,000	14,200
1993	136,000	136,200	14,000	15,800
1994	176,500	187,700	16,000	10,900
1995	171,000	176,400	11,000	14,200
1996	168,000	166,200	14,000	15,000
1997	230,000	228,500	15,000	14,800
1998	272,000	296,600	15,000	10,500
1999	256,000	271,500	10,000	10,500
2000	305,000	300,100	10,500	17,500
2001	406,500	411,600	17,500	16,000

3.3.5 Profile of the Recreational Fisheries

The recreational or sport fishery, where fishing is done for pleasure and not sale, has been part of the culture and economy of West Coast fishing communities for more than 50 years. Most recreational anglers use hook and line gear that is held directly in the hand or is attached to a pole or rod that is held in the hand. Recreational fishing occurs along the entire coast. Anglers fish from man-made structures such as piers, jetties, docks; natural shore areas; privately owned or rental boats; and charter vessels. Licenses for individual sport anglers are issued by the states of Washington, Oregon and California , with each state having its own specific requirements. Sport fishing licenses are issued to residents and non-residents and may vary in cost by the level of participation (ie: 1-day, 2-day, annual), fishery, and fishing location. In addition, there may be a few special days each year where anyone can fish without a fishing license. In California, anyone 16 years and older must have a fishing license to take any kind of marine fish, except for persons angling from a public pier in ocean or bay waters. Only a basic fishing license is required for fishing in the ocean north of Point Arguello (34° 35' N. Lat.) in Santa Barbara County, while an

Ocean Enhancement Stamp is required for ocean fishing south of Point Arguello (except when fishing under authority of a two-day sport fishing license.) One-day Pacific Ocean-only licenses, with or without an Ocean Enhancement Stamp are also issued. In Oregon, anyone 14 years or older is required to have a general angling license to fish for or land marine fish except when fishing for smelt or when they are a resident landowner or member of their immediate family and are angling on land they own and reside upon. In Oregon, all anglers, regardless of age, need a Combined Harvest Tag to fish for salmon, steelhead, sturgeon, and halibut. When angling in the Pacific ocean within 3 miles of shore between Cape Falcon, Oregon and Leadbetter point, Washington, either a resident Washington license or an Oregon license is valid. In Washington, a saltwater license is required for anyone who is 16 years or older and allows the license holder to fish for any species existing in saltwater, including salmon, steelhead, sturgeon, halibut, rockfish, etc.

In 1998, an economic survey funded by NMFS and coordinated with the PSMFC was conducted. Anglers were asked to participate in a telephone interview in addition to the interview conducted in the field. The following are some highlights from the survey:

1) 81% of the 37,570 anglers interviewed in California, Oregon and Washington provided trip information, including fishing expenditures.

2) Average year of birth for anglers was 1953.

3) Average rank of saltwater fishing ability on a scale of 1 to 5 was 3.2.

4) Average years of saltwater fishing experience was 20 years.

5) Average annual personal income before taxes was $57,000.

6) Average annual household income before taxes was $58,000.

7) Average hourly wage was $20.

8) Average hours worked per week was 45.

9) Average annual expenditure on fishing gear was $545.

10) Average annual expenditure on fishing licenses was $82.

11) Average annual expenditure on maintenance and repair of boats used for saltwater fishing was $640.

12) 20% of anglers stayed away from home overnight when they went fishing.

13) 64% of anglers whose fishing involved an overnight stay away from home indicated that the primary purpose of their trip was fishing

Similarly, the states register and issue licenses for recreational boats owned and operated by state residents. The registration requirements and fees vary between the states and are based on type and size of vessel. In California, every sail-powered vessel over 8 feet in length (except wind surfing boards) and every motor driven boat not registered by the U. S. Coast Guard that is used in California state waters is subject to registration. In Oregon, the Oregon State Marine Board is responsible for registering and titling all recreational boating vessels. Registration and title fees and marine fuel taxes support boating facilities, marine law enforcement and boating safety education. All motorized boats, regardless of length or type, must be registered and sailboats 12 feet or longer must also be registered in Oregon . In Washington state, motorized vessels and any vessel that is 16 feet or longer must be registered with the state.

Charter fishing as defined in section 2101(21a) of title 46, United States Code, is fishing from a vessel that is hired to carry passengers who engage in recreational fishing. In the Pacific coast groundfish fishery, there are two categories of charter vessels, party boats (also called “Six-Packs” for the number of passengers carried) and U.S.C.G. Certified passenger vessels (also called commercial passenger fishing vessels). The party boats are authorized by the U.S. Coast Guard to carry no more than six paying passengers. In general, these boats are smaller (although not necessarily small), are not required to pass rigorous Coast Guard inspection requirements and can be operated by skipper with a lower license rating. Commercial passenger fishing vessels are certified by the U.S. Coast Guard to carry a specific number of passengers. The vessels undergo a rigorous inspection every two years and must meet strict standards. Captains must also have a license to operate the vessel. In addition, if the certified boat is out for more than 12 hours, as in an over night trip, a second licensed captain must be on board. Table 3.3.4.1 shows the number of recreational charter vessels by port for 2001.

Within the recreational fishery, groundfish are both targeted and caught incidentally when other species such as salmon, are targeted. Until recent years, it was thought that commercial fisheries took the vast majority of marine fishery catch in the EEZ. However, recent data indicate that catches by the recreational fisheries are a notable portion of the total landings of some groundfish species. For some overfished species, such as lingcod, canary rockfish, bocaccio, and yelloweye rockfish, there are fairly large recreational catches. Table 3.3.8 shows the relationship of recreational and commercial total rockfish harvests, 1993-2001.

Table 3.3.7 Number of Recreational Charter Vessels Fishing in Ocean Waters in 2001, by Port

State	Port/area	Number of Recreational Charter Vessels
Washington	Neah Bay	15
	La Push	2
	Westport	32
	Ilwaco	28
	TOTAL	77
Oregon	Astoria	22
	Tillamook	51
	Newport	45
	Coos Bay	13
	Brookings	15
	Unknown	86
	TOTAL	232
California	Crescent City	1
	Eureka	4
	Fort Bragg	14
	San Francisco	67
	Monterey	33
	Conception (north)	129
	San Diego	95
	Unknown	72
	TOTAL	415
	TOTAL FOR ALL STATES	724

Table 3.3.8 Landings of All Rockfish by Commercial and Recreational Sectors 1993- 2001 (PacFin/RecFin)

Year	Recreational (mt)	Commercial (mt)	Total	Percent Recreational
1993	2,741	38,274	41,015	7%
1994	2,378	31,656	34,034	7%
1995	1,726	30,257	31,983	5%
1996	2,141	28,919	31,060	7%
1997	2,583	24,680	27,263	9%
1998	2,325	20,867	23,192	10%
1999	2,580	14,952	17,532	15%
2000	2,578	13,358	15,936	16%
2001	1,985	7,674	9,659	21%

Data source: PacFin data were extracted November 25, 2002

Marine recreational fishing on the West Coast has been on an increasing trend since 1996 (PFMC 2002).

In 2001, 2.5 million marine recreational anglers took 5.2 million trips (1 million of these trips occurred in the federal EEZ) and are estimated to have caught 11,676 mt of fish of which 3,084 mt were groundfish. Most angling occurs during the summer months with fewer anglers fishing northward during the winter. Eighty eight percent of the trips in all ocean waters (state and federal waters) were made in California, followed by 9 percent in Washington, and 3 percent in Oregon. The number of participants has increased from 1.6 million in 1999 and 2.2 million in 2000. The number of trips has also increased from 3.1 million (0.64 million in the Federal EEZ) in 1999 and 4.6 million in 2000 (1.1 million in the Federal EEZ).

A portion of the increased recreational fishing effort is likely the result of longer salmon seasons that are associated with increased abundance and availability of salmon. Prior to 1996 when salmon seasons were shortened to protect declining populations, target effort shifts from recreational salmon fishing to groundfish targeting likely occurred. It is uncertain how much groundfish catch contributes to the overall incentive to engage in a recreational fishing. However, it seems likely that the frequency of groundfish catch on a trip adds to overall enjoyment and perceived value. Tables 3.3.9 - 3.3.11 identify the number of participants, fishing trips, and catch by fishing mode for 2001.

In southern California, most angling effort takes place from private/rental boats (43% of all ocean and trips or 49% of trips into the EEZ) and from charter vessels (27% of all ocean and trips or 51% of trips into the EEZ). Approximately 13 percent of the charter vessels take spear fishing divers. The recreational fishery in southern California targets a variety of species including: shelf and nearshore rockfishes (including California scorpionfish); lingcod; cabezon; California barracuda; yellowtail; ocean whitefish; tuna (including yellowfin and albacore); flatfish (including California halibut and sanddabs); kelp bass; barred sand bass, and spotted sandbass; white sea bass and California sheephead. Salmon are infrequently taken in southern California. Shelf rockfish, lingcod, California barracuda, yellowtail, ocean whitefish, and tunas are primarily taken by anglers aboard private/rental and charter vessels. The other species are taken by anglers from all modes. Divers primarily take nearshore rockfishes, lingcod, California sheephead, and Kelp bass.

In northern California, most of recreational angling effort takes place from private/rental boats and from shore (46% of all ocean trips or 61% of trips into the EEZ). Spear fishing represents a very small amount of the effort with less than 2 percent of the charter vessels catering to divers. The recreational fishery in northern California primarily targets shelf and nearshore rockfishes, lingcod and salmon. In addition, cabezon, greenling, albacore, and flatfish (including sanddabs and California halibut) may be targeted. Shelf rockfish, lingcod, salmon, and albacore are primarily taken by charter vessels and private/rental boats. Greenling are primarily taken by private /rental boats and shore anglers. Other species are taken by anglers from all modes.

In Oregon, most recreational angling effort takes place from private/rental boats (62% of all ocean and trips or 67% of trips into the EEZ). The recreational fishery in Oregon primarily targets shelf and nearshore rockfishes, lingcod, greenling, Pacific halibut, salmon, cabezon, and albacore. Salmon and nearshore species such as greenling and cabezon are primarily taken by private/rental vessels, while the remaining species are more equally divided between the charter and private/rental boats.

In Washington, most recreational angling effort takes place from private/rental vessels (57% of all ocean trips or 58% of trips into the EEZ). The recreational fishery in Washington primarily targets shelf, and nearshore rockfishes, lingcod, greenling, Pacific halibut, salmon, sablefish, and albacore. Nearshore rockfish is primarily taken by charter vessels, while catch of the other species are more closely divided between the charter and private/rental boats.

Table 3.3.9 Estimated Number of Anglers in Ocean Fisheries 2001, by Fishing Mode, Thousands of Anglers (MRFSS)

	Coastal Residents	Non-coastal Residents	Out-of state Residents	Total
Southern California	1,054	15	185	1,255
Northern California	454	72	63	589
Oregon	312	30	84	426
Washington	571	36	49	655

Coastwide	2,390	154	n/a	2,544

Table 3.3.10 Estimated Number of Fishing Trips in Ocean Waters 2001 by Fishing Mode, Millions of Trips (EEZ only) (MRFSS)

	Party/charter Vessel	Private/Rental Vessel	Shore	Total
Southern California	0.99 (0.32)	1.39 (0.31)	0.86	3.24 (0.63)
Northern California	0.26 (0.09)	0.62 (0.14)	0.46	1.34 (0.23)
Oregon	0.10 (0.02)	0.31 (0.04)	0.09	0.50 (0.06)
Washington	0.05 (0.05)	0.08 (0.07)	0.01	0.14 (0.12)
Total	1.40 (0.47)	2.41 (0.56)	1.41	5.22 (1.03)

Table 3.3.11 Estimated Recreational Groundfish Catch in Ocean Waters 2001 by Fishing Mode, Metric Tons

	Party/charter Vessel	Private/Rental Vessel	Total
Southern California	165	252	419
Northern California	728	945	1,675
Oregon	370	387	759
Washington	182	48	231
Total	1,445	1,632	3,084

Regulatory management measures available to manage the West Coast recreational groundfish catch include, but are not limited to, harvest guidelines, quotas, landing limits, frequency limits, gear restrictions, time/area closures, bag and size limits, permits, other forms of effort control. For 2003, recreational fisheries effort will be constrained to protect overfished species, particularly for lingcod, canary rockfish, bocaccio, and yelloweye rockfish. Washington, Oregon, and California will adopt through state regulation seasons, bag limits, and size limits to best fit the needs of their recreational fisheries in their states while also meeting conservation goals of the FMP.

For 2003, recreational fisheries management off Washington and Oregon have been structured to maintain low yelloweye rockfish catch, an overfished species primarily taken with hook and line gear. In reviewing the take of yelloweye rockfish in their recreational fisheries, the states of Washington and Oregon found that yelloweye rockfish is most frequently taken by vessels that travel offshore to target Pacific halibut. However, yelloweye rockfish are not taken while the vessel is fishing for halibut, but rather after the vessel has completed its halibut fishing and is headed for port. Recreational fishing restrictions proposed by California are intended to ensure that fishing mortality of bocaccio, canary rockfish, cowcod, and lingcod do not exceed limits associated with rebuilding these overfished species. Because California's recreational fisheries management measures were not sufficiently conservative to prevent their fisheries from exceeding their set asides for overfished rockfish species in 2001 and 2002, more restrictive measures will be used for 2003. Management measures adopted for 2003 are fully described in the proposed rule for 2003 Annual Specifications and Management Measures (January 7, 2003; FR 936.)

In addition to the leisure benefits that recreational anglers receive from participating in marine fisheries, they generate monetary benefits in the form of sales, income, and employment throughout the Pacific Coast region. A wide variety of goods and services are purchased by anglers from sporting goods stores,

speciality stores, bait and tackle shops, guide services, marinas, grocery stores, automobile service stations, and restaurants. The economic impacts of these purchases occur throughout the Pacific Coast economy and provide income and jobs in manufacturing, transportation industries, and service sectors. Across Washington, Oregon, and California, it is estimated that recreational anglers spent $4.5 billion on marine recreational fishing in 2000, with Southern California anglers spending the most ($2.5 billion). Nationwide, recreational fishing expenditures total $21 billion (Gentner et al. 2001). The recreational fishery in Washington, Oregon, and California are associated with $254 Million in personal income and almost 10,000 jobs; the groundfish fishery represented $71 Million and 2,800 jobs, respectively or about 28% of the total (Table 3.3.13.).

Table 3.3.12 Recreational Fishery Harvest by Region for Party/charter Boats and Private/rental Boats, 2001, in Metric Tons (RecFin)

	Lingcod	Nearshore Rockfish	Shelf Rockfish	Other Nearshore Groundfish	Other Shelf Groundfish	Other Groundfish	Total Groundfish	Salmon	Halibut	Highly Migratory Species	Other	Total
Washington												
Charter	17	153	11	1	0	0	182	33	105	0	0	320
Private	15	20	10	3	0	0	48	38	103	0	0	189
Total	32	175	21	3	0	0	231	70	208	0	0	509
Oregon												
Charter	53	274	33	10	0	0	370	91	21	0	7	489
Private	60	282	12	33	0	0	387	1,108	3	11	176	1,685
Total	114	557	46	42	0	0	759	1,199	24	11	183	2,176
Northern California												
Charter	41	351	316	20	0	0	728	187	0	80	53	1,048
Private	90	290	111	439	15	0	945	1,384	0	387	1,048	3,764
Total	131	642	426	460	16	0	1,675	1,572	0	467	1,100	4,814
Southern California												
Charter	4	26	73	47	14	1	165	0	0	348	1,088	1,601
Private	19	15	112	78	26	2	252	0	0	411	1,907	2,570
Total	23	41	186	125	41	3	419	0	0	759	2,999	4,177
Coastwide												
Charter	115	804	433	78	14	1	1,445	311	126	428	1,148	3,458
Private	184	607	245	553	41	2	1,632	2,530	106	809	1,148	3,458
Total	300	1,415	679	630	57	3	3,084	2,841	232	1,237	4,282	11,676

Table 3.3.13 Total Pacific Coast Region Expenditures by Resident Status, 2000 (millions of dollars) (Gentner et al. 2001)

Pacific Coast Region	Total	Upper Bound	Lower Bound	Total	Upper Bound	Lower Bound
Trip Expend	**Residents ($)**			**Non- Residents ($)**		
Private Transportation	111	142	80	32	35	29
Food	75	81	70	13	14	12
Lodging	32	36	28	16	19	14
Public Transportation	3	4	2	49	60	38
Boat Fuel	46	51	40	3	4	2
Party/Charter Fees	64	70	58	8	9	6
Access/Boat Launching	10	11	9	1	2	1
Equipment Rental	8	10	7	7	9	5
Bait & Ice	31	34	27	3	3	2
Trip Sub-Totals	380	413	347	132	144	120
Annual Expenditures						
Rods & Reels	144	160	128			
Other Tackle	115	127	103			
Gear	27	30	23			
Camping Equipment	16	21	11			
Binoculars	5	6	3			
Clothing	19	23	15			
Magazines	5	5	4			
Club Dues	4	5	3			
License Fees	72	78	66			
Boat Accessories	371	462	279			
Boat Purchase	1,066	1,234	899			
Boat Maintenance	304	343	266			
Fishing Vehicle	1,326	1,669	983			
Fishing Vehicle Maintenance	285	332	239			
Vacation Home	98	161	34			
Vacation Home Maintenance	103	199	8			
Equipment & Durable Goods Sub-total	3,959	4,361	3,546			
All Sub-totals	4,339	4,743	3,925	132	144	120
Pacific Coast Region Total	4,471	4,875	4,057			

Table 3.3.14 Coastal Community Income Impacts for the Recreational Fishery by Area, 2001 (PFMC, 2002)

Area		Charter ($1000s)	Private ($1000s)	Total ($1000s)	Jobs
Washington Coast	Total	$5,335	$3,285	$8,620	392
	Groundfish	$1,134	$385	$1,519	69
Oregon	Total	$6,382	$4,911	$11,293	514
	Groundfish	$4,227	$783	$5,011	228
California	Total	$99,616	$135,195	$234,811	8,899
	Groundfish	$43,983	$21,481	$64,465	2,468
Total	Total	$111,332	$143,392	$254,724	9,823
	Groundfish	$48,345	$22,649	$70,994	2,765

3.3.6 Profile of the Processing Sector

With the exception of the portion of Pacific whiting catch that is processed at sea, all other Pacific coast groundfish catch is processed in shore-based processing plants along the Pacific coast. By weight, 1998 commercial shorebased groundfish landings were distributed among the three states as follows:

Washington, 24%; Oregon, 65%; California, 11%. By value, commercial groundfish landings are distributed among the three states as follows: Washington, 21%; Oregon, 46%; California, 33% (PFMC, January 2003). The discrepancies between the Oregon and California portions of the landings are expected because Oregon processors handle a relatively high percent of the shore-based whiting landings, a high volume, low value fishery. Conversely, California fishers land more of the low volume, high value species as a proportion of the total state-wide catch than Oregon fishers.

Shorebased Sector. Several thousand entities have permits to buy fish on the West Coast. Of these 1,780 purchased fish caught in the ocean area and landed on Washington, Oregon, or California state fish tickets in the year 2000 (excluding tribal catch) and 732 purchased groundfish. Larger volume buyers tend to handle groundfish more than smaller volume buyers. Of the 546 buyers purchasing in excess of $20,000 of West Coast landings, 59% bought groundfish. These 546 buyers bought 99% of all Council managed groundfish. Of the 1,234 buyers purchasing less than $20,000 from West Coast vessels, 33% bought groundfish. The number of buyers handling groundfish from trawl vessels is substantially lower than all of those handling groundfish. Only 17% (125) of all groundfish buyers (732) handled fish from trawl vessels. These 125 buyers comprise only 7% of all buyers (1,780). Buyers of trawl caught groundfish are important to nontrawl vessels as well, handling 60% (by value) of the groundfish caught by nontrawl vessels. Table 3.3.4.9 displays the number of buyers as compared to the groundfish buyers, grouped by total expenditures for the year 2000 (excluding at-sea whiting).

Table 3.3.15 Number of West Coast Buyers and Groundfish Buyers in 2000 (excluding at-sea whiting)

Buyers' Total Expenditures on West Coast Harvests	All Buyers	Nongroundfish Buyers	Groundfish Buyers	Groundfish Buyers as % of all Buyers
>$2 Million	21	2	19	90%
$1-$2 Million	33	14	19	58%
$300 Thousand - $1 Million	98	36	62	63%
$100-$300 Thousand	121	49	72	60%
$20-$100 Thousand	273	123	150	55%
$5 -$20 Thousand	372	224	148	40%
<$5 Thousand	862	600	262	30%
Total	1,780	1,048	732	41%

The largest volume buyers tend to handle trawl vessels more than smaller volume buyers. Of the 38 largest buyers of groundfish (those with purchases in excess of $1 million), 73% (28) bought from trawl vessels Seventy-eight percent of all groundfish purchases from trawl vessels go to the 28 trawl buyers with total purchases of all species in excess of $1 million. These 28 buyers also handle 39% of the exvessel value of the nontrawl purchases.

Table 3.3.16 Number of West Coast Groundfish Buyers in 2000 by gear group (excluding at-sea whiting)

Buyers' Total Expenditures on West Coast Harvests	Groundfish Buyers	Trawl caught groundfish buyers	Non-trawl caught groundfish buyers
>$2 Million	19	17	2
$1-$2 Million	19	11	8
$300 Thousand - $1 Million	62	33	29
$100-$300 Thousand	72	23	49
$20-$100 Thousand	150	19	131
$5 -$20 Thousand	148	11	137
<$5 Thousand	262	11	251
Total	732	125	607

Mid-size buyers tend to have greater importance for nontrawl vessels than for trawl vessels. Fifty percent of all nontrawl sales go to buyers with total purchases of between $20 thousand and $1 million, as compared to 22% for trawl vessels. Absent cost and exprocessor sale price data, very rough assumptions must be made to consider possible levels of dependence of processors on groundfish. However, it is

assumed here that gross exvessel value of purchases is a rough indicator of relative levels of dependence. Large buyers of groundfish tend to have a lesser percentage of their overall purchases from groundfish than smaller buyers. Table 3.3.4.11 displays the value of purchases by west coast processors in 2000 (excluding at-sea whiting).

Table 3.3.17 Value of Purchases by west coast buyers in 2000 (PFMC 2002)

	All buyers	Groundfish buyers	
	Total purchases ($1,000)	Total purchases of all species ($1,000)	Total purchases of groundfish ($1,000)
>$2 Million	95,742	90,762	28,680
$1-$2 Million	45,343	25,851	8,585
$300 Thousand - $1 Million	56,115	36,527	11,278
$100-$300 Thousand	21,427	12,543	3,269
$20-$100 Thousand	12,881	7,297	2,023
$5 -$20 Thousand	3,989	1,519	501
<$5 Thousand	1,278	426	218
Total	236,775	174,926	54,554

At-Sea Sector. There are two classes of vessels in the at-sea processing sector of the whiting fishery, catcher-processors that harvest and process their own catch, and mothership vessels that process unsorted catch received from smaller catcher vessels. The processing vessels are large (>250 ft in length) and carry crews of 65-200, who mostly work in shifts to keep the factories operating day and night.

The first year of implementation of a license limitation program in the Pacific groundfish fishery was 1994. Vessels that did not initially qualify for a permit had to buy or lease one from qualifying vessels to gain access to the fishery. To harvest whiting, all at-sea catcher-processors had to purchase or lease permits. This changed the composition of the at-sea processing fleet considerably, increasing the number of motherships, because permits are not required for vessels that only process (PFMC 1998). Unlike catcher/processors and catcher vessels, motherships do not have permits to harvest groundfish in the WOC.

In 2001, 20 catcher vessels delivered whiting to five non-tribal mothership processors and four tribal catcher vessels delivered whiting to a single tribal mothership. Some vessels may deliver catch exclusively to motherships off Alaska and the West Coast, but in recent years, about half of the non-tribal vessels also delivered whiting to shore-based processing facilities in Washington, Oregon and California. Similarly, the tribal mothership also processes whiting in the non-tribal sector before the start of the tribal fishery. In 2001, seven catcher/processors participated in the whiting fishery.

Since May 1997, when the Department of Justice approved allocation of whiting shares among the members of the Whiting Conservation Cooperative, the catcher-processor fishery has operated as a voluntary quota share program where each of the catcher-processor companies has agreed to take a specific share of the harvest. With harvests assured, the catcher-processors are able to operate more cautiously to avoid areas of salmon and rockfish abundance. The motherships, however, operate under more competitive conditions (first come first served) for their sector's allocation. The U.S. whiting allocation has been fully utilized by domestic processors since 1992.

Whiting is a high volume species, but it commands a relatively low price per pound. The at-sea processing vessels have onboard surimi production capacity and were initially designed to fish for pollock in the groundfish fisheries off Alaska. Because whiting is a similar species to pollock, harvesting and processing technology and equipment used in the Alaskan fisheries is also used for whiting. In addition, to surimi, most of these vessels have the capacity to produce frozen fillet blocks and have fish meal plants to process small whiting, incidentally caught groundfish species and fish offal.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

How This Section is Organized

This Section examines the environmental consequences that could be expected to result from adoption of each of the alternatives to both the specifications and management measures process issue and to the optimum yield duration issue. As discussed in Section 1.0, Purpose and Need for Action, the purposes in and needs for considering these alternatives are to:

- Comply with a court order to provide more opportunity for public comment in the NMFS rule publication process
- Streamline the process of and reduce the workload associated with developing specifications and management measures so that more Council and NMFS time may be devoted to issues other than specifications and management measures development.

Therefore, this section will consider the environmental effects of the specifications and management measures process and of the potential alternatives to that process, as well as considering the environmental effects of alternative OY durations. The specific effects of the specifications and management measures adopted for 2003 were analyzed in the EIS for the 2003 ABC and OY specifications and management measures (Council 2003.) Concurrent to this FMP amendment, the Council is also considering Amendment 16, an FMP amendment on rebuilding overfished species. The NEPA analysis for Amendment 16 and for the overfished species rebuilding plans associated with Amendment 16 will evaluate the alternatives for rebuilding overfished species and how rebuilding measures that are part of the specifications and management measures process affect the human environment.

This section forms the analytic basis for the comparison of issues across alternative specifications and management measures processes and alternative OY durations. The potential of each alternative to affect one or more components of the human environment is discussed in this section; direct and indirect effects of the alternatives are discussed in this analysis. Direct effects are caused by an action and occur at the same time and place as the action, while indirect effects occur later in time and/or further removed in distance from the direct effects (40 CFR 1508.27). Direct effects of some of the alternatives include the effects of a potential change in the start date of the fishery management period on the Council's management process. Indirect effects from a change in fishery start date could include increased or decreased fishing pressure on particular groundfish stocks at different times of the year.

4.1 Physical Impacts of the Alternatives

Physical impacts generally associated with fishery management actions are effects resulting from changes in the physical structure of the benthic environment as a result of fishing practices (e.g. gear effects and fish processing discards). Although groundfish fishing activity affects the physical environment, the process of implementing specifications and management measures does not have an effect on the physical environment. Discussions of the effects on the physical environment of the specifications and management measures for a particular year are found within the appropriate NEPA analyses for that year's specifications and management measures. Concurrent to this Amendment 17, NMFS is also drafting an Environmental Impact Statement on the effects of groundfish fishing on EFH. The effects on the physical environment of the full suite of groundfish management measures and policies will be considered within that EIS.

4.2 Biological Impacts of the Alternatives

The biological impacts generally associated with fishery management actions are effects resulting from: 1) harvest of fish stocks that may result in changes in food availability to predators, changes in population

structure of target fish stocks, and changes in community structure; 2) entanglement and/or entrapment of non-target organisms in active or inactive fishing gear; 3) major shifts in the abundance and composition of the marine community as a result of fishing pressure.

In this section, alternative specifications and management measures processes and alternative OY durations are examined for their potential effects on the biological environment. The primary areas where the process itself could affect the environment are: 1) the effect of potential fishing effort shifts caused by changes to the fishing season start date on target and non-target species; 2) the effect of the management process on the age of the resource surveys and assessments used in setting harvest specifications; and 3) the effect of the management process on the ability of the scientific process to describe and analyze the status of groundfish stocks and to estimate the harvestable surpluses of those stocks. Amendment 17 is administrative in nature and is not expected to have significant effects on the biological environment. If, at the beginning of a fishery management cycle, the Council sets suitably conservative harvest management measures, the season start date would not have any effect on the biological environment. In 2000 and 2001, however, management measures set at the beginning of the management cycle (January 1) were not conservative enough to maintain a year-round fishery for all species and all fishing sectors. If the fishery closures in the latter halves of these two years are indicative of future management challenges, the fishery season start date may have an effect on the biological environment, discussed below. Amendment 17 would also affect the scientific process for developing stock assessments that supports the Council's management process. The timing of the scientific process may have indirect effects on the quality of data and scientific analyses used in setting specifications and management measures. Table 4.2 provides these effects in a matrix format.

Table 4.2.1 Summary of the Potential Biological Impacts of Alternative Specifications and Management Measures Processes and Alternative OY Durations

BIOLOGICAL ISSUES	Effects on marine communities from fishing effort shifts due to season changes	Effects on the age of the resource surveys and assessments used in setting harvest specifications	Effects on data availability (Fishery and mortality data, age, size, growth & recruitment data, resource surveys)	Effects on advanced models (Stock assessments, multi-species interactions, habitat, climate)
Threshold	If this specifications and management measures process results in a time-shift in fishing effort, how might it affect when specific stocks and stock mixes are taken?	"Best available data" and "most recently available data" are two different concepts. How would this specifications and management measures process affect the use of the most recently available data?	Could this specifications and management measures process result in more and better catch, abundance, and biological data being available to stock assessment modelers and the public?	Could this specifications and management measures process provide more opportunities to develop, review and refine scientific models to improve the "best available science?"
Process Alternative 1, status quo, no action: 2-meeting annual process (Sept & Nov,) Jan 1 start date	Status quo/no action alternative tends to result in early attainment of harvest allocations and fishing closures during Oct-Dec. Although this schedule decreases fishing pressure during early winter flatfish spawning aggregation months of Nov-Dec, fishing pressure is heavy again during later flatfish spawning aggregation months of Jan-March. Bycatch of protected rockfish species in flatfish fisheries tends to be lower during winter flatfish spawning aggregation periods. This schedule also leaves open fishing opportunities during summer months, when flatfish tend to move to more shallow depths and when bycatch of protected slope rockfish species is higher in fisheries targeting healthier slope rockfish and DTS stocks. Because Alternative 1 is an annual process, all OYs are one-year OYs, although a particular species may have the same one-year OY for several years at a time, depending upon stock assessment timing.	Under status quo/no action, resource surveys are conducted annually. Stock assessments are conducted triennially, with one-third of all assessed stocks receiving assessment updates each year. For some species, data from a resource survey in Year 1 is assessed in Year 2 and fishing occurs on that assessment in Year 3. At the other extreme, data from a resource survey in Year 1 is not assessed until Year 4, with fishing occurring on that assessment in Year 5. For all alternatives, resource surveys occur in summer/autumn months. Assessments based on those surveys are generally not available until May 1 of the following year. Duration of OYs, whether one-year, two-year, or mixed would not affect data availability.	No measurable effect on data gathering and availability. Availability of data used to assess stock status and potential biological yields tends to be most dependent on financial commitments that agencies & other interested parties make to data gathering. Catch data needed for inseason monitoring least available/ reliable early in fishing year. Jan 1 fishing year start could result in more in-year management fluctuations for species with heavier fishing pressure during Jan-Apr (DTS complex, flatfish.) Duration of OYs, whether one-year, two-year, or mixed would not affect data availability.	Status quo/no action alternative uses annual updates of one-third of all assessed stocks, with STAR processes that review both models used and data sources that contribute to models. Status quo STAR process increases workload for stock assessment authors who are annually preparing both models and data sources used in models for STAR review. Duration of OYs, whether one-year, two-year, or mixed would not affect advanced modeling.
Process Alternative 2: 3-meeting biennial process (April, June & Sept,) Mar 1start date	Given closure trends under status quo, March 1 start date would likely result in early allocation attainment and closures during Dec-Feb. Alternative 2 could thus reduce fishing pressure on flatfish during winter spawning aggregation months, but could also result in greater fishing pressure on healthy flatfish stocks in periods when bycatch of protected rockfish stocks is higher. Like Alternative 1, summer fishing months would continue open. If this alternative were implemented with some or all species managed with two-year OYs, as opposed to one-year OYs, early attainment and closure period could lengthen, possibly to Oct-Feb of second year in two-year fishing period. With two-year OYs, management measures would need to be more conservative at the start of the two-year fishing period to hedge against early closures during the second year in the fishing period.	Biennial management process would allow a biennial scientific process. Additional financial resources devoted to groundfish resource surveys should allow for biennial or annual surveys. Under this 3-meeting process, a resource survey would occur in Year 1, stock assessments in Year 2, management deliberations in Year 3, and fishing based on the Year 2 stock assessments would occur in Years 4 and 5. This alternative allows roughly the same newness of data use as the status quo alternative for two-thirds of assessed stocks, with *later* data use for one-third of assessed stocks. Duration of OYs, whether one-year, two-year, or mixed would not affect data availability.	No measurable change in data gathering and availability over Alternative 1. Alternative 2 has March 1 start date, which could result in more in-year management fluctuations for species with heavier fishing pressure during Mar-Jun (DTS complex & flatfish for Mar/ Apr; widow & yellowtail rockfish taken in pelagic trawls, all species taken in small boat hook-and-line fisheries during warmer May/June period.) Duration of OYs, whether one-year, two-year, or mixed would not affect data availability.	Improvement in model development and data use over Alternative 1. Biennial management process would allow biennial scientific process, with model development and review occurring in one year, then stock assessments that plug data into developed models occurring in alternate years. Biennial process could be expected to improve quality & variety of models used, to improve use of already-collected data on unassessed stocks, and to allow more time for exploring habitat and ecosystem modeling. Duration of OYs, whether one-year, two-year, or mixed would not affect advanced modeling.

BIOLOGICAL ISSUES	Effects on marine communities from fishing effort shifts due to season changes	Effects on the age of the resource surveys and assessments used in setting harvest specifications	Effects on data availability (Fishery and mortality data, age, size, growth & recruitment data, resource surveys)	Effects on advanced models (Stock assessments, multi-species interactions, habitat, climate)
Process Alternative 3: 3-meeting, biennial process (Nov, March/April & June,) Jan 1 start date	If biennial process sets annual harvest allocations against biennial OYs, this alternative should have no measurable changes over Alternative 1. If this alternative were implemented with some or all species managed with two-year OYs, as opposed to one-year OYs, early attainment and closure period could lengthen over Alternative 1, possibly to Aug-Dec of second year in two-year fishing period. With two-year OYs, management measures would need to be more conservative at the start of the two-year fishing period to hedge against early closures during the second year in the fishing period.	Same as Alternative 2 with respect to both annual specifications process and OY duration issues.	No measurable change over Alternative 1 with respect to either annual specifications process or OY duration issues.	Same as Alternative 2 with respect to both annual specifications process and OY duration issues.
Process Alternative 4: 3-meeting, biennial process (June, Sept & Nov,) May 1 start date	Given closure trends under status quo, May 1 start date would likely result in early allocation attainment and closures during Feb-Apr period. Alternative 4 would thus allow fishing pressure on flatfish during winter spawning aggregation months, when bycatch of protected rockfish stocks is lower. The major biological disadvantage of this alternative is that fishery data availability would be lowest during summer months of first year of the two-year fishing period. Pleasant weather summer months tend to have greater vessel participation and tend to show higher bycatch of protected rockfish stocks in fisheries targeting healthier stocks. If this alternative were implemented with some or all species managed with two-year OYs, as opposed to one-year OYs, early attainment and closure period could lengthen over Alternative 1, possibly to Dec-Apr of second year in two-year fishing period. With two-year OYs, management measures would need to be more conservative at the start of the two-year fishing period to hedge against early closures during the second year in the fishing period.	Biennial management process would allow a biennial scientific process. Additional financial resources devoted to groundfish resource surveys should allow for biennial or annual surveys. Under this 3-meeting process, a resource survey would occur in Year 1, stock assessments and management deliberations in Year 2, and fishing based on those assessments would occur in Years 3 and 4. This combination of a 3-meeting process with Years 3 and 4 use of data is possible because of the May 1 fishing period start date. This alternative allows roughly the same newness of data use as the status quo alternative for two-thirds of assessed stocks, with *earlier* data use for one-third of assessed stocks. Duration of OYs, whether one-year, two-year, or mixed would not affect data availability.	No measurable change in data gathering and availability over Alternative 1 with respect to both annual specifications process and OY duration issues. Alternative 4 has May 1 start date, which could result in more in-year management fluctuations for species with heavier fishing pressure during May-Aug (widow & yellowtail rockfish taken in pelagic trawls; all species taken in small boat hook-and-line fisheries in warm months.)	Same as Alternative 2 with respect to both annual specifications process and OY duration issues.
Process Alternative 5: 2-meeting, biennial process (June & Sept,) March 1 start date	Same as Alternative 2 with respect to both annual specifications process and OY duration issues..	Same as Alternative 4 with respect to both annual specifications process and OY duration issues. However, earlier use of data is possible with this alternative because it is a 2-meeting process. Of the four biennial alternatives, this alternative provides the shortest time between resource survey and fishing activity.	Same as Alternative 2 with respect to both annual specifications process and OY duration issues..	Same as Alternative 2 with respect to both annual specifications process and OY duration issues..

4.2.1 Biological Effects of Changing the Fishing Season Start Date and of Differing OY Durations

With the specifications and management measures process, fishery managers set annual harvestable amounts for each groundfish species or species group and try to construct trip limits for those species that will allow the harvest of the OYs of healthy stocks without allowing total catch of overfished and depleted stocks to exceed their OYs. Setting a year of trip limits is a delicate balancing act that requires consideration of when groundfish stocks and non-groundfish stocks are most available, when healthy and depleted stocks mix in a way that makes clean harvesting of healthy stocks more likely, and when different sectors of the fishing fleet are most likely to fish with which type of gear and in what waters. Ideally, managers would like to set a trip limit structure at the beginning of the fishing year that perfectly predicts all of these variables. In reality, however, fish stocks and the fishing fleet often behave in ways that are not predicted by the harvest models used in setting the year's management measures. As fishery scientists and managers track the fishery through the year, landings levels may be higher or lower than predicted at the beginning of the year. At within-year analyses of landings levels, usually at the Council's April, June, and September meetings, managers will make inseason adjustments to trip limit levels to either accelerate or decelerate landings rates. Under the current management structure (status quo/no action alternative,) managers have historically allowed more fishing during the warm weather months, with the expectation that landings of some species may be restricted or shut down toward the end of the calendar/fishing year.

For many years, the Council has managed the groundfish fishery with the aim of maintaining a year round fishery, as articulated in Goal 3 and Objective 7 of the FMP:

> Goal 3: "Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities"
>
> Objective 7: "Identify those sectors of the groundfish fishery for which it is beneficial to promote year-round marketing opportunities and establish management policies that extend those sectors fishing and marketing opportunities as long as practicable during the fishing year."

The Council has historically interpreted Goal 3 and Objective 7 to mean that all sectors of the fishery should be open year round, with the exception of the primary whiting and primary sablefish seasons. Maintaining a year round fishery has become more difficult in recent years, due to the need to reduce the effects of the different sectors of the fishery on overfished species. Commercial and recreational hook-and-line fisheries off California south of 40°10' N. lat., for example, have had shortened seasons in 2001 and 2002. In both of these years, many groundfish fishery sectors have been also shut down or notably reduced in the latter half of the year. These fishery closures and reductions were needed largely because managers had set management measures underestimating the level of fishery participation in the first half of the year.

Amendment 17 contemplates changing the process for setting specifications and management measures, not the standards by which they are set or the goals for managing the fishery. Whether the majority of fishery sectors continue to operate year round is a factor of management measures developed at the beginning of the fishing period, not a factor of when that fishing period begins. Because the fishing period start date will not affect the overall amount of each target species taken within the fishing period, there is no discernable difference between the effects of the different fishing period start dates on targeted groundfish stocks. If fishery managers were able to perfectly predict fishing effort for all sectors at all times during the year, the different fishing period start dates would also have no effect on the bycatch of overfished and depleted stocks. If, however, the pattern of late-season closures continues, the effect of the fishery on incidentally taken overfished and depleted species will vary according to the times of year when fishing effort is strongest. These effects could have been even stronger if the Council had recommended using two-year OYs for some (Issue 2, Alternative 3) or all (Alternative 2) managed species. Without adequately conservative initial management measures, the closure period could become

a 6-7 month closure at the end of the second fishing year, rather than two 3-4 month closures at the end of each fishing year.

Figure 4.2.1 Volume of Groundfish Landings By Month, 1997-2001

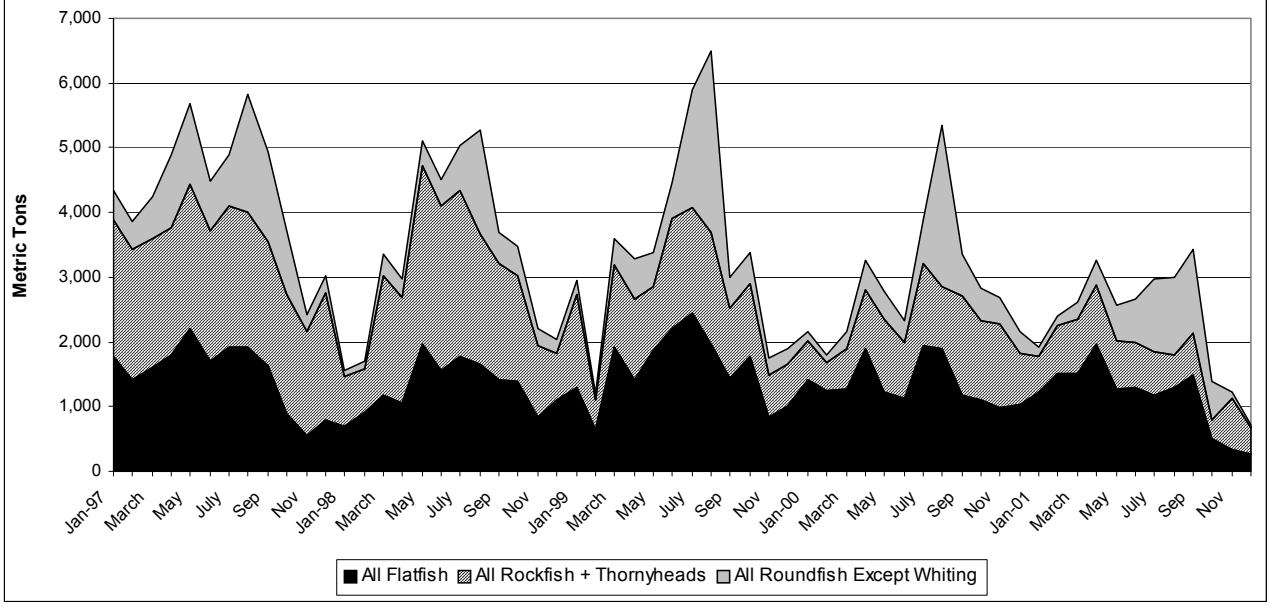


Figure 4.2.1 shows groundfish landings by month, for 1997-2001. Over this five year period, there has been a notable decline in overall groundfish landings, particularly for rockfish species. In each year, roundfish landings spiked during the summer sablefish seasons. In all years, landings of all groundfish were higher in the March-September period than in the winter months. This same trend was also evident in 2001, although the year-end decline in 2001 was due to regulatory restrictions rather than to either market restrictions or fisher disinclination to operate during winter weather. Each year also shows a spike of higher landings in January, at the new opening of the fishing years. Although the year-round fishery policy is evident in that groundfish landings are being made in every month, the greatest volume of groundfish landings has occurred during the summer months.

Figures 4.2.2-5, below, show the estimated bycatch rates of overfished species taken incidentally in DTS complex (Dover sole, thornyheads, sablefish) and flatfish trawl fisheries north and south of 40°10' N. lat. [Note: Figures 4.3.2 and 4.3.3, for north of 40°10', show a bycatch rate percentage scale of up to 5% of target landings amounts. Figures 4.3.4 and 4.3.5, for south of 40°10', show a bycatch rate percentage scale of up to 2% of target landings amounts.] For most of the overfished species, these figures show higher bycatch rates in bimonthly periods 3 (May-June) and 4 (July-August). These estimated bycatch rates were provided by James Hastie of the NMFS Northwest Fisheries Science Center and have been used in the Environmental Impact Statement for the 2003 specifications and management measures and by the Council in its deliberations concerning that management action.

Under Process Alternative 1 (status quo/no action,) harvest allocations tend to be attained by late fall, with restrictions or closures occurring in the October through December period. This schedule tends to reduce pressure on flatfish stocks during the early part of their spawning season; however, spawning is usually still occurring when the fishery re-opens January 1. The advantage of allowing heavier fishing pressure on flatfish stocks during their spawning season is that they tend to be most aggregated then, less mixed with other groundfish stocks like rockfish. The disadvantage of allowing fishing on spawning aggregations that occur during the early part of the management period is that the fish are so readily available for harvest

that a large proportion of the year's harvestable surplus for a particular species may be taken in the first few months of the fishery. In a fishery managed by an FMP that puts a priority on year-round harvest availability, a large harvest of healthy flatfish stocks early in the year could jeopardize the availability of flatfish or co-occurring protected stocks later in the year. A January 1 fishing period start date also usually ensures that the fishery will be open during the summer months. Hook-and-line fisheries do not tend to target flatfish stocks, but do pursue sablefish and rockfish during the summer. Status quo fixed gear sablefish management allows a small daily or weekly trip limit fishery for the limited entry and open access fisheries throughout the year and the larger limited entry tiered sablefish fishery. Sablefish stock health is more likely affected by possible discard in the daily/weekly trip limit fisheries and possible highgrading discard in the tiered fisheries than by any particular overall fishing period start date.

Figure 4.2.2 Flatfish Fishery North of 40°10', Bycatch Rates of Overfished Species

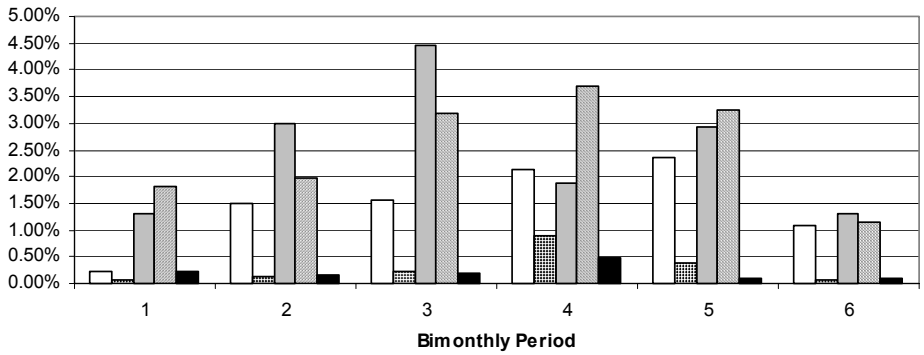
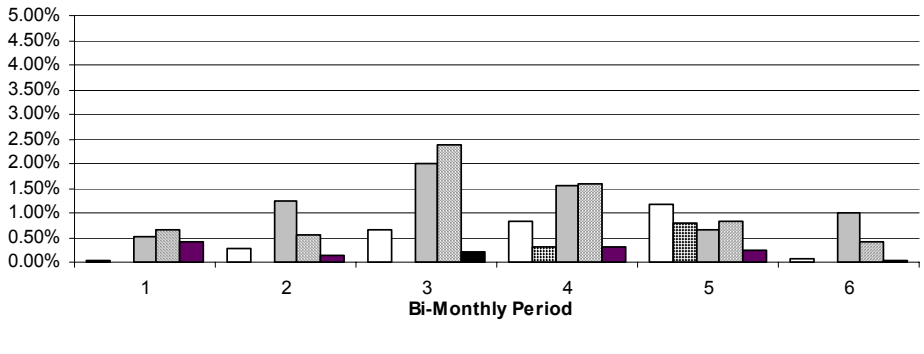


Figure 4.2.3 DTS Fishery North of 40°10', Bycatch Rates of Overfished Species



Like the status quo alternative, Process Alternative 3 also has a January 1 fishing period start date. Process Alternative 3, however, is a biennial process. This process alternative allows consideration of the OY duration alternatives (Issue 2). Specifications, such as ABCs, could be set for two years without affecting fishery participation. If harvest allocations or OYs are set in two-year increments, fishing pressure could be fairly consistent for the first 18 months of the two-year period, with notable restrictions and closures in the final six months of the period. To protect against this possibility, the Council would have to set particularly conservative management measures during the early part of the first fishing year in the period.

For both Process Alternative 1 and Process Alternative 3, the October-December slow period tends to fall in months when bycatch of overfished species occurs at relatively lower rates. The Council first analyzed the bycatch rates of overfished species in particular target fisheries for its 2002 specifications and management measures. That analysis was used to concentrate fisheries targeting healthy stocks in the months when bycatch of overfished species tends to be lower. Unanticipated landings of darkblotched rockfish south of 40°10' in the commercial fishery and unexpectedly high bocaccio landings in the recreational fishery south of 40°10' led to early closures of fisheries affecting both of these stocks. The

start date of the fishery does not affect the bycatch rates of overfished species taken in fisheries targeting healthier stocks. However, if fishery landings have outcomes that were unexpected when management measures were set, as happened in 2002, fishery slowings and closures would occur toward the end of the management period. If Process Alternative 3 were combined with two-year OYs (OY Duration Alternatives 2 or 3,) fishery slowings and closures would likely occur during the second half of the second year of the management period.

Figure 4.2.4 Flatfish Fishery South of 40°10', Bycatch Rates of Overfished Species

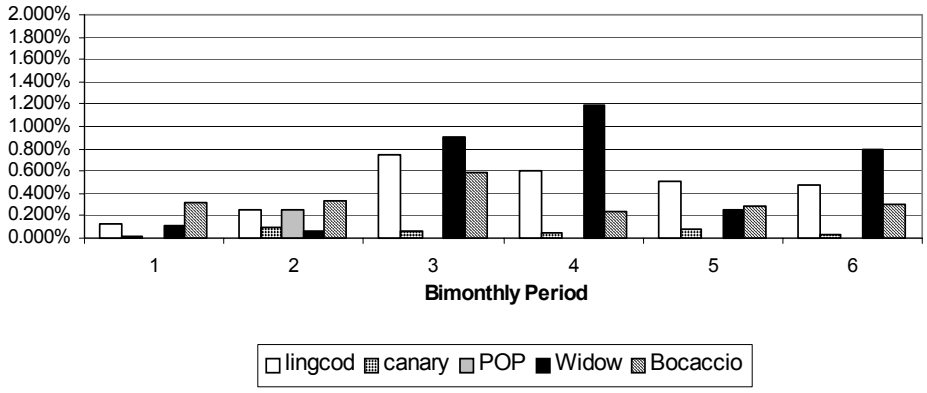
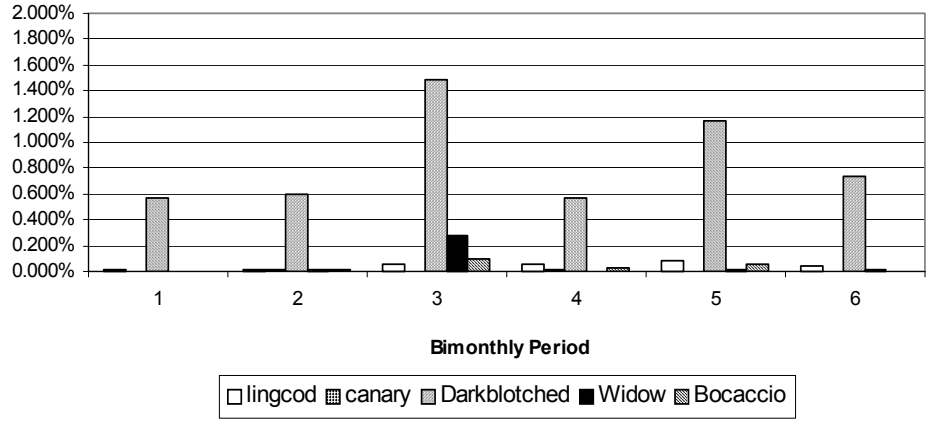


Figure 4.2.5 DTS Fishery South of 40°10', Bycatch Rates of Overfished Species



For some fisheries, landings data may not be available for use in data analysis until several months after the landings have been made. In general, the states of Oregon and Washington have fairly swift commercial fishery data availability, while the commercial landings made in California may not be available in a coastwide database until 3-5 months after the landings have been made. Recreational fisheries data, primarily the Recreational Fisheries Information Network (RecFIN) database, is usually not considered an accurate picture of landings until a full year of fishing has occurred and data from that year has been analyzed. Given these commercial and recreational fisheries data delay situations, a January 1 fishing period start date may not allow stock assessment authors working in January-April to use all of the data from the prior fishing year in their assessments.

Process Alternatives 2 and 5 are biennial processes with March 1 fishing period start dates. A March 1 start date, with a corresponding February 28/29 ending date could push the restriction and closure period from the status quo October-December to a new December-February. For flatfish fishing on spawning aggregations, this change in slow periods may or may not affect incidental catch rates of overfished species. Vessels that have traditionally targeted flatfish during the January-February period could instead target flatfish during November-December, although that strategy change could mean forgoing Dungeness crab fishing opportunities. Similar to Process Alternatives 1 and 3, Process Alternatives 2 and 5 would ensure open fisheries during the summer months, which have traditionally been stronger for hook-and-line fisheries. Also like Process Alternative 3, these two biennial processes could have the management

challenge of stronger effort in the first year and a half of the two-year management period with restrictions and closures for possibly 4-6 months of the second year. These longer closures during the second year of the management period would be more likely if the Council had chosen to use two-year OYs (OY Duration Alternatives 2 and 3) instead of one-year OYs (OY Duration Alternative 1.) Changing the fishing period start date to March 1 from January 1 would not change the amounts of either targeted or incidentally taken stocks that are harvested in the groundfish fishery. As discussed above for Process Alternatives 1 and 3, however, the fishing period start date could affect the months of the period-end fishery slowings and closures. Under Process Alternatives 2 and 5, the expected slow months of October-February tend to have the lowest incidental catch rates of overfished species. Regardless of which fishing period start date is chosen, annual landings of targeted healthy stocks could be increased if landings levels were concentrated during the winter months to take advantage of the lower overfished species bycatch rates during those months. With a March 1 fishing year start date and the typical January-April stock assessment schedule, commercial and recreational fishery data used in stock assessments would be less up to date than it would be under Process Alternatives 1 and 3. Stock assessment scientists would be working with data from about two-thirds of the prior fishing year, whereas the January 1 start date would allow data use from about three-quarters of the prior fishing year.

Process Alternative 4 is a biennial process with a May 1 start date. A May 1 start date, with a corresponding April 30 ending date could push the restriction and closure period from the status quo October-December to a new February-April. The advantage of this start date is that it would leave open some of the stronger months for targeting healthy stocks with lower incidental catch of overfished species. Unfortunately, the notable biological disadvantage of a May 1 start date is that fishery data availability would be lowest during the summer months of the first year of the two-year fishing period. Summer weather tends to allow greater fishery participation and the summer months tend to show higher incidental catch rates for overfished stocks taken in fisheries targeting healthy stocks. In order to protect against unpredictable harvest spikes, managers would have to severely restrict early summer fishing in at least the first year of the two-year fishing period. Without those restrictions, landings in those early months could quickly eat up allocations of both healthy and protected stocks. With respect to bycatch of overfished species, this process alternative is similar to all of the others in that it could result in fishery slowings and closures occurring during months when the bycatch rates of overfished species tend to be lower. And, as with all other process alternatives, choosing an OY duration alternative that would allow two-year OYs could result in a longer slowing and closure period at the end of the two-year cycle if the management measures set at the start of the cycle were not adequately conservative. With a May 1 fishing year start date and the typical January-April stock assessment schedule, commercial and recreational fishery data used in stock assessments would be less up to date than it would be under all other alternatives. Stock assessment scientists would be working with data from about one-half of the prior fishing year under this alternative.

Many of the potential biological effects of shifting the fishing year start date and of setting two-year OYs should more properly be considered effects of the Council's year-round fishery policy, rather than effects of the start date of a management period. If, for example, the trawl flatfish fisheries were managed with a four month season of November through February, allocations of those flatfish stocks could be taken entirely during periods when bycatch of overfished stocks is relatively low.

4.2.2 Biological Effects of Changing to the Management Process on "Best Available Science" and Stock Assessment Timeliness

At National Standard 2, the Magnuson-Stevens Act requires that conservation and management measures be based on the best available scientific information (16 U.S.C. 1826). Table 4.2.1, above, briefly analyzes the effects of changing the specifications and management measures process on the:

- Age of the resource survey and stock assessments used in setting harvest specifications
- Availability and quality of more and better catch, abundance, and biological data

- Availability and quality of advanced scientific models used to assess stock and ecosystem health

Section 3.2.1 discusses the scientific process and the types of information and tools needed for that process. In considering the biological effects of the management process on the environment, we must look at the quality of the scientific information that we use in that management process. The Magnuson-Stevens Act and other legislation commonly call for the use of the "best available science," but that concept is often confused with "most recently available science." For example, data from a resource survey conducted in 2002 may be the most recently available data for informing the harvestable surplus of a particular species in 2003, but without a stock assessment for that species, using that data for the 2003 fishing season could not be considered using the best available science.

Data availability from resource surveys and other sources is generally dependent upon the financial resources that scientific agencies devote to gathering data. For many years, NMFS has conducted triennial West Coast groundfish resource surveys. A recent strengthening of Congressional interest in scientific information about West Coast groundfish has provided the agency with the resources to conduct biennial or annual resource surveys. These increased data gathering resources would be available under any of the process alternatives. Therefore, this document discusses the effect of all of the process alternatives on best available science with the assumption that all alternatives, including status quo, include annual or biennial resource surveys. While the specifications and management measures process should not affect the availability and quality of data used as the basis for stock assessments and other scientific analyses, that process can affect when the data is used and the scientific process by which it is used. Resource survey timing and use of data from those surveys would be affected by the process alternatives as follows:

Table 4.2.2 Data Availability and Use in the Management Process

	Alternative 1			Alternative 2	Alternative 3	Alternative 4	Alternative 5
Resource Survey Conducted	Year 1			Year 1	Year 1	Year 1	Year 1
Stock Assessment Conducted	1st/3rd stocks, Year 2, using Year 1 data	2nd/3rd stocks, Year 3, using Years 1-2 data	3rd/3rd stocks, Year 4, using Years 1-3 data	Year 2	Year 2	Year 2	Year 2
Management Process Occurs	1st/3rd stocks, Year 2	2nd/3rd stocks, Year 3	3rd/3rd stocks, Year 4	Year 3	Year 3	Year 2	Year 2
Fishing on Year 1 Resource Survey Occurs	1st/3rd stocks, Years 3-5 on Year 1 data	2nd/3rd stocks, Years 4-6 on Years 1-2 data	3rd/3rd stocks, Years 5-7 on Years 1-3 data	Years 4/ 5*	Years 4/ 5	Years 3/4*	Years 3/4*
Time Gain/Loss of "Most Recently Available Data" Over Other Alternatives	Data is used sooner than all other alternatives for at least 1/3rd of assessed stocks each year. However, assessments for all stocks occur on less frequent basis than all biennial alternatives, which means that data is also used for the *longest* period under this alternative.			Data use oldest in this alt., as fishing occurs in Years 4/5 and fishing year begins March 1.	Data use older than Alts. 4 and 5, but slightly more recent than Alt. 2 due to January 1 start.	Data use newer than Alt. 2 by 10 months and newer than Alt. 3 by 8 months.	Data use newest in this alt. Newer than Alt. 2 by a year, than Alt. 3 by 10 months, and than Alt. 4 by 2 months.

*For Process Alternatives 2 and 5, the "year" in which fishing would occur would be March 1 through February 28/29. For Process Alternative 4, the "year" would be May 1 through April 30.

In addition to affecting the timing of resource survey data use, the management process can also affect the quality and type of scientific analysis conducted on that data. An annual specifications and management measures process does not allow contributing scientific agencies enough time to conduct stock assessments on all assessed species each year. As a result, the status quo stock assessment process is to update stock assessments for one-third of all assessed species each year. Stock assessment authors will also try to add new stocks to the list of assessed species every year, although the addition of new species sometimes results in the delay of stock assessments for other species (See

Section 3.2.1). Under a biennial management process (Process Alternatives 2-5,) the scientific process would also become biennial, with one year spent on developing and evaluating stock assessment models and the second year spent on analyzing resource survey and other data. The major benefits of allowing more time for model exploration and development would be more rigorously analyzed stock assessments and overfished species rebuilding models for currently assessed stocks, new assessment models for unassessed stocks for which data already exists, and new modeling efforts on multi-species interactions, habitat use, or ecosystem/climate models.

Stock assessments are conducted to determine the abundance of fish stocks and to project the level of future catch that will achieve the target harvest policy. These determinations cannot be made with absolute accuracy and the further they are used to project into the future, the greater the confidence intervals on the projection. When an assessment is conducted, it will use accumulated historical data as well as data that is as current as possible. Thus, assessments gradually should become more accurate as they incorporate longer time series and "learn" from past assessments. However, several factors contribute to inaccuracy in the projections. Projections may be inaccurate if: the assessment itself is inaccurate, future recruitments are different than projected in the assessment, or future catch differs from the level forecast in the assessment. Although there is much research devoted to prediction of recruitment levels, substantial improvement in this area is years away. Therefore, it is necessary to frequently update assessments to track true changes in stock abundance and adjust for past inaccuracies in stock estimates.

Over the past 15 years, the timeliness of the transition from survey to assessment to management action has varied greatly. The most timely has been that for Pacific whiting. Summer whiting surveys have been analyzed the following winter and used to adjust the fishery level less than a year after the survey is conducted. But this survey is only conducted triennially so this high timeliness has occurred only every third year. For most other species, the most recent survey data has already been one to several years old when it is used in the assessments, and the assessment results are used to set an ABC level that is kept constant for about three years until another assessment is conducted. During the stock declines of the 1990's, this low timeliness meant that downward adjustments in ABC lagged substantially behind the stock declines, thus contributed to the decline itself.

There are insufficient data, funds and staff to update every assessment every year for immediate adjustment of harvest levels. However, status quo ABC and OY calculations are best estimates and do not incorporate any consideration for the timeliness of implementation. The level of inaccuracy of the projection may cause either underachievement of optimum yield or overfishing. If projected catches are to have no more than a 50% probability of exceeding the overfishing level, then future harvest rates may need to be reduced to adjust for the increased inaccuracy of long projections. If a higher degree of avoiding overfishing is desired, then it would be even more important to progressively reduce the harvest level as the interval between assessments increases.

As shown in Table 4.2.2, the status quo/no action alternative tends to allow the use of the most recently available data for at least one-third of all assessed stocks. This use of most recently available data, however, should not be confused with the use of the best available science. Process Alternatives 2-5 would tend to provide the management process with better science than the annual stock assessment and management process of Process Alternative 1. These biennial alternatives provide stock assessment scientists with a greater opportunity to review and improve overall stock assessment methods and models, as they provide a two year cycle of stock assessments and model review. Of the four biennial alternatives, Process Alternative 5 makes the most timely use of stock assessments and provides the best insurance that fishing activities conducted against those stock assessments will reflect the pictures of stock health and abundance drawn by those assessments. Process Alternative 2 allows the longest time lag between resource surveys and fishing activities conducted against the stock assessments that fall out of the surveys. Thus, under Process Alternative 2, the Council would likely have to set more conservative harvest levels than under Process Alternative 5 in order to ensure that a retrospective analysis of fishing activities does not show that overfishing has occurred. Process Alternatives 3 and 4 fall between

Alternatives 2 and 5 in terms of their timeliness of stock assessment use, with Alternative 3 being less timely than Alternatives 4 and 5, and Alternative 4 being more timely than Alternatives 2 and 3.

4.3 Socio-Economic Impacts of the Alternatives

The socio-economic impacts generally associated with fishery management actions are effects resulting from: 1) changes in harvest (whether directed commercial or indirected as recreational charter) availability and processing opportunities that may result in unstable income opportunities; 2) changes to access privileges associated with license limitation and individual quota systems; 3) fishing season timing or structure restrictions that may improve or reduce the safety of fishing activity; 4) fishing season timing or structure restrictions that may or may not take into account the social and cultural needs of fishery participants. Of these elements, the specifications and management measures process would not affect access privileges. The Council is currently discussing license limitation in the open access fisheries and trawl permit stacking. If the Council decides to move forward with either of these programs, the effects of changing fishery access privileges would be analyzed in the appropriate NEPA documents for those programs.

In this section, alternative specifications and management measures processes are examined for their potential socio-economic effects. The primary areas where the process itself could affect fishing industries and communities are: 1) the effect of changes to the fishing season start date on harvest availability and processing opportunity; 2) the effect of changes to the fishing season start date on fishery structure and safety; 3) the effect of changes to the fishing season start date on social and cultural needs of fishery participants. In addition to these direct effects on fishery management actions on fishing industries and communities, changing the specifications and management measures process may affect the fishing public, general public, and participants in the fishery management process in: 1) the amount of management and science time devoted to developing annual specifications and management measures and the resultant staff resources for actions outside of that process; 2) the number and timing of Council meetings used to develop specifications and management measures; 3) the time available for public participation in the NMFS publication and evaluation of Council specifications and management measures recommendations. Table 4.3.1 provides these effects in a matrix format.

Table 4.3.1 Summary of Potential Socio-Economic Impacts of Alternative Specifications and Management Measures Processes and Alternative OY Durations

SOCIO-ECONOMIC ISSUES	Effects of changing season start date on harvest availability and processing opportunity	Effects of changing season start date on safety and social/cultural needs of fishing communities	Effects of management time and public review and analysis devoted to specifications and management measures process
Threshold	How would this specifications and management measures process affect harvest availability and processing opportunity for fishery participants? Would participation in fisheries other than groundfish fisheries be affected by a change in season start date?	How would this specifications and management measures process affect the safety of fishery participants? Would changing the start of the fishing season affect the social/cultural needs of fishing communities?	Does this specifications and management measures process allow more or less management time for other, non-specifications activities? How does this particular process affect public review and comment opportunities?
Process Alternative 1, status quo, no action: 2-meeting annual process (Sept & Nov,) Jan 1 start date	Status quo/no action alternative tends to result in early attainment of harvest allocations and fishing closures during Oct-Dec. For fishers wishing to operate during winter months and for processing plants, this slow groundfish period coincides with the Dungeness crab fishing and processing season. Just as Dungeness crab opportunities are decreasing in January-February, groundfish are again available for harvesting and processing. Recreational fishing tends to be slow during this period for most of the West Coast, except perhaps south of Point Conception, CA.	The specifications and management measures process itself does not tend to affect the safety of fishery participants, although the fishing period start date could have some effect on safety. Under status quo, fishing opportunities tend to slow down or close entirely during early winter months when offshore conditions are less navigable (Oct-Dec.) Cultural groups that might be most affected by a possible Oct-Dec closure could include individual fishers and processors wanting to increase their pre-holiday incomes and gain access to seasonal markets.	Status quo/no action alternative tends to devote the most management time to specifications and management measures because it is an annual process. The status quo schedule has a 2-meeting (Sept/Nov) process of Council proposals and final recommendations, followed by a Jan 1 publication of NMFS final rule implementing those regulations. In this process, public comment is received by the Council during the Sept/Nov period and by NMFS following publication of the final rule. Of the five alternatives, this schedule is the most compressed for management staff. For 2002, the Council held a 3-meeting process (June/Sept/Nov) followed by a Jan 1 NMFS proposed and emergency rule publication and public comment period and a Mar 1 final rule publication. While this 2002 variation lengthened staff time for the Council process, it increased staff workload for the NMFS process without increasing available work time. Duration of OYs, whether one-year, two-year, or mixed would not affect management time and public review and analysis devoted to specifications and management measures.
Process Alternative 2: 3-meeting biennial process (April, June & Sept,) Mar 1start date	Given closure trends under status quo, March 1 start date would likely result in early allocation attainment and closures during Dec-Feb. Similar to Alternative 1, this alternative would result in slower groundfish landings or closures during a period of higher Dungeness crab landings. With this potential closure period, however, fishers and processors might have less access to the stronger flatfish spawning aggregations of the mid-winter period. As with Alternative 1, recreational fishing tends to be slow during the winter months. If this alternative were implemented with some or all species managed with two-year OYs, as opposed to one-year OYs, early attainment and closure period could lengthen, possibly to Oct-Feb of second year in two-year fishing period. With two-year OYs, management measures would need to be more conservative at the start of the two-year fishing period to hedge against early closures during the second year in the fishing period.	This alternative would tend to result in declining landings and closures during the Dec-Feb period, which like the slow months of Alternative 1 include rougher winter weather months. Cultural groups that might be most affected by a possible Dec-Feb closure could include individual fishers and processors wanting to increase their pre-holiday incomes or gain access to seasonal markets. Under two-year OY duration alternatives, the slowing and closure period could lengthen, possibly to Oct-Feb, in which case groups affected by this period under both Process Alternatives 1 and 2 would be affected by the longer slow period in the second fishing year of the two year period.	Like all of the biennial alternatives, Alternative 2 would decrease overall time spent on developing specifications and management measures because the process would take place every two years instead of every year. Public review and comment would occur in Apr/Sept period for the Council process and following a Jan 1 publication of a NMFS proposed rule. Of the five alternatives, this schedule allows the most lengthy period for Council staff work time (11-19 months,) as it relies on stock assessments conducted in the prior year. NMFS staff work time = 5.5 months. This alternative relies on an April meeting for proposing specifications, which have historically been final meetings for salmon management process, leaving little Council time and energy for groundfish issues. March 1 start date would mean that inseason adjustments for final 3 months of year (Dec-Feb) would be made at a Nov meeting. Duration of OYs, whether one-year, two-year, or mixed would not affect management time and public review and analysis devoted to specifications and management measures.

SOCIO-ECONOMIC ISSUES	Effects of changing season start date on harvest availability and processing opportunity	Effects of changing season start date on safety and social/cultural needs of fishing communities	Effects of management time and public review and analysis devoted to specifications and management measures process
Process Alternative 3: 3-meeting, biennial process (Nov, March/April & June,) Jan 1 start date	Same as Alternative 1. If this alternative were implemented with some or all species managed with two-year OYs, as opposed to one-year OYs, early attainment and closure period could lengthen, possibly to Aug-Dec of second year in two-year fishing period. With two-year OYs, management measures would need to be more conservative at the start of the two-year fishing period to hedge against early closures during the second year in the fishing period.	Same as Alternative 1. Under two-year OY duration alternatives, the slowing and closure period could lengthen, possibly to Aug-Dec, in which case groups affected by this period under both Process Alternative 1 as well as vessels and processors that tend to not have groundfish alternatives in early autumn would be affected by the longer slow period in the second fishing year of the two year period.	Alternative 3 would be similar to Alternative 2 in benefits derived from Council time devoted to issues other than the groundfish specifications and management measures. Depending on when stock assessments are complete, this alternative could provide Council staff 14 months work time and NMFS staff 6.5 months work time. This alternative includes an April (salmon) meeting. Jan 1 start date would mean that inseason adjustments for final 3 months of year (Oct-Dec) would be made at Sept meeting, with final check for Dec at the Nov meeting. Duration of OYs, whether one-year, two-year, or mixed would not affect management time and public review and analysis devoted to specifications and management measures.
Process Alternative 4: 3-meeting, biennial process (June, Sept & Nov,) May 1 start date	Given closure trends under status quo, May 1 start date would likely result in early allocation attainment and closures during Feb-Apr period. This schedule would keep the fisheries open through stronger flatfish months and allow participants to switch between flatfish and Dungeness crab at will. A Feb-Apr groundfish closure could also have the negative effect of a very lean 3-month period between Dungeness crab fishing/processing season and the shrimp, salmon and albacore seasons. For some of the small boat fishers, this alternative could also mean a lack of fishing opportunity in their traditional start-up fishing months. Early spring recreational fishing opportunities could also be curtailed under this schedule. If this alternative were implemented with some or all species managed with two-year OYs, as opposed to one-year OYs, early attainment and closure period could lengthen, possibly to Dec-Apr of second year in two-year fishing period. With two-year OYs, management measures would need to be more conservative at the start of the two-year fishing period to hedge against early closures during the second year in the fishing period.	This alternative would tend to result in declining landings and closures during the Feb-Apr period, which could mean increased fishing during the preceding rough winter weather months. Treaty tribe subsistence fishing for groundfish could be most affected by May 1 start date, as a notable proportion of tribal groundfish landings occur in March-April, concurrent with the tribal halibut season start. Although tribal groundfish landings opportunities could not be restricted based on non-tribal use of all available resources, management between tribal and non-tribal fishing opportunities would have to be monitored more closely to ensure groundfish availability for tribal fishing seasons. Under two-year OY duration alternatives, the slowing and closure period could lengthen, possibly to Dec-Apr, in which case groups affected by this period under both Process Alternatives 2 and 4 would be affected by the longer slow period in the second fishing year of the two year period.	Alternative 4 would be similar to Alternative 2 in benefits derived from Council time devoted to issues other than the groundfish specifications and management measures. This alternative could provide Council staff 9 months work time and NMFS staff 6 months work time. May 1 start date would mean that inseason adjustments for final 5 months of year (Dec-Apr) would be made at a Nov meeting, with final check for Apr at the March meeting. May 1 fishing period start date would require restructuring of the non-tribal whiting and fixed gear primary sablefish season management processes, as both seasons currently begin in April. May 1 fishing period start date could also require change to tribal sablefish management process, as treaty tribes' sablefish season currently begins in March. This alternative would not interfere with a salmon-focused Council meeting. Duration of OYs, whether one-year, two-year, or mixed would not affect management time and public review and analysis devoted to specifications and management measures.
Process Alternative 5: 2-meeting, biennial process (June & Sept,) March 1 start date	Same as Alternative 3 with respect to both annual specifications process and OY duration process.	Same as Alternative 3 with respect to both annual specifications process and OY duration process.	Alternative 5 would be similar to Alternative 2 in benefits derived from Council time devoted to issues other than the groundfish specifications and management measures. This alternative could provide Council staff 9 months work time and NMFS staff 5.5 months work time. Like Alternative 2, March 1 start date would mean that inseason adjustments for final 3 months of year (Dec-Feb) would be made at a Nov meeting. Unlike Alternatives 2-4, this alternative would be a 2-meeting Council process, leaving less Council meeting time for discussing specifications and management measures. This alternative would not interfere with a salmon-focused Council meeting. Duration of OYs, whether one-year, two-year, or mixed would not affect management time and public review and analysis devoted to specifications and management measures.

4.3.1 Socio-Economic Effects of Changing Season Start Date

As detailed above in Table 4.3.1, the five process alternatives consider a range of fishing season start dates: January 1 (Alternatives 1 and 2,) March 1 (Alternatives 2 and 5,) and May 1 (Alternative 4.) In crafting these alternatives, the Multi-Year Management Committee considered only fishing year start dates that would coincide with both the start of a traditional "major" commercial cumulative limit period and with the start of a Recreational Fisheries Information Network (RecFIN) two-month recreational fishing "wave." Using these criteria was intended to allow a smooth transition of catch and landings data analysis from the current specifications and management measures process to any of the alternative processes. Based on these criteria, potential start dates could have been January 1, March 1, May 1, July 1, September 1, and November 1.

Groundfish has historically provided West Coast commercial fisheries participants with a relatively steady source of income over the year, supplementing the other more seasonal fisheries (Table 4.3.2). Although groundfish contributed only about 17% of total annual ex-vessel revenue during 2000, seasonally groundfish played a more significant role, providing 1/5 to 1/3 of ex-vessel revenue coastwide during April and also each of the three summer months.

Table 4.3.2 Percent of monthly exvessel value of all 2000 commercial fishery landings made on the West Coast in various fisheries stratified by month ($000)

Species Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Sablefish	0.8%	1.3%	3.6%	6.0%	3.7%	3.4%	6.3%	20.3%	5.7%	4.4%	4.3%	2.2%	5.8%
Whiting	0.0%	0.0%	0.0%	0.2%	1.9%	3.5%	7.6%	6.7%	4.4%	0.0%	0.0%	0.0%	2.3%
Flatfish	8.9%	5.5%	5.4%	7.1%	4.1%	3.2%	3.2%	2.7%	2.7%	3.0%	3.2%	3.0%	4.2%
Rockfish	2.5%	3.3%	5.6%	6.5%	5.6%	4.7%	5.6%	3.3%	5.9%	5.0%	6.8%	3.2%	4.6%
Other GF	0.2%	0.7%	0.3%	0.7%	1.1%	1.4%	1.3%	0.8%	0.8%	0.5%	0.4%	0.3%	0.7%
Shrimp/Prawns	1.6%	2.7%	3.8%	6.8%	7.1%	16.2%	14.3%	8.2%	8.3%	5.0%	1.6%	1.3%	6.2%
Crab/Lobster	51.0%	41.6%	29.6%	19.6%	15.9%	13.0%	7.2%	4.3%	8.3%	18.3%	18.4%	50.3%	23.5%
Salmon	0.2%	0.3%	0.2%	0.7%	17.1%	13.7%	10.0%	13.6%	13.3%	8.2%	2.0%	0.4%	6.9%
HMS	1.2%	6.5%	2.6%	4.7%	1.1%	1.4%	7.3%	16.3%	19.8%	19.6%	8.6%	6.7%	8.9%
CPS	13.5%	13.3%	11.3%	10.6%	8.1%	6.1%	7.8%	4.9%	6.5%	11.6%	25.0%	15.4%	11.0%
Other	20.2%	24.9%	37.5%	37.2%	34.3%	33.4%	29.3%	18.9%	24.2%	24.4%	29.7%	17.3%	25.9%

Section 4.2.1 discusses the potential biological effects on the marine environment of changing the fishing season start date. While not necessarily implied by choice of start date, the status quo January 1 fishing period start has historically tended to result in more intense fishing pressure at the beginning of the year, followed by increased overall participation and reduced per vessel participation mid-year, with any necessary landings slow downs or closure occurring around October-December. Extending this logic, shifting the start date to March 1, May 1, July 1, September 1 or November 1 would simply shift the activity cycle forward by a corresponding number of months, but still result in late season closures.

Impacts on markets supplied by the affected fisheries would be limited to possible changes or disruptions in the supply of local groundfish to fresh markets and to processors. While this may negatively affect fishers, processors, restaurants and others involved in the local supply chain, it is not anticipated to have a significant impact on the overall availability or price of fish in local markets because West Coast groundfish do not command a large enough share of world markets to notably affect prices, and local shortages would be offset by local supplies of substitute species or by supplies imported from outside the region.

Process Alternative 3 uses the same January 1 start date as the status quo/no action Process Alternative 1. Under both alternatives, following current season trends, harvest allocations would tend to be attained

Figure 4.3.1 Landings Volumes for Selected Larger-Volume West Coast Fisheries, 1997-2001

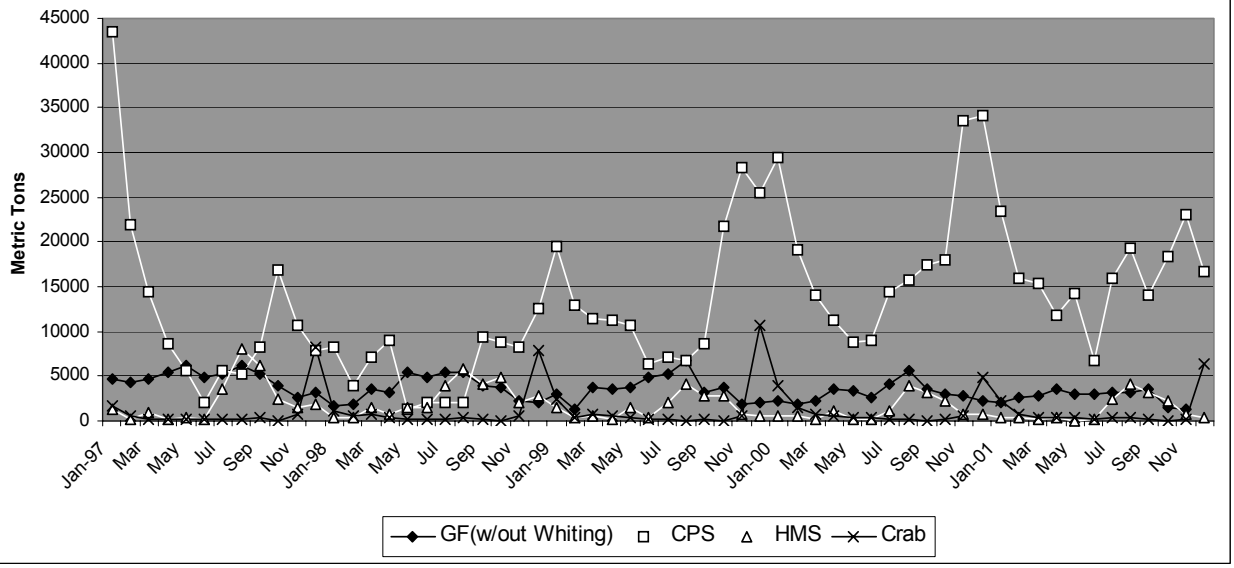
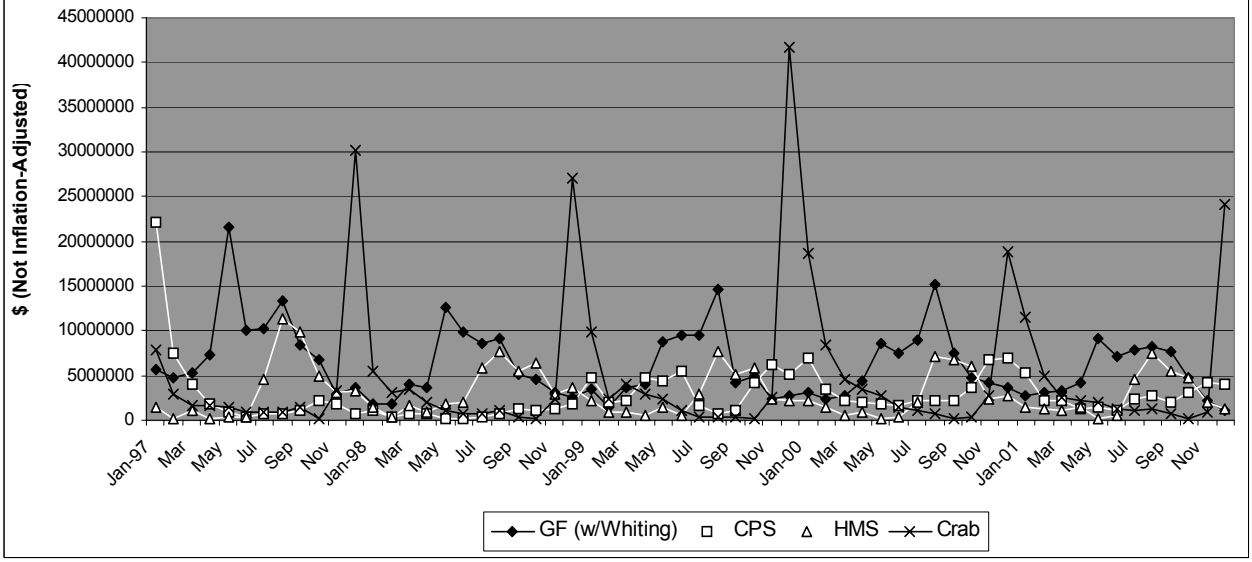


Figure 4.3.2 Landings Value for Selected Higher-Value West Coast Fisheires, 1997-2001

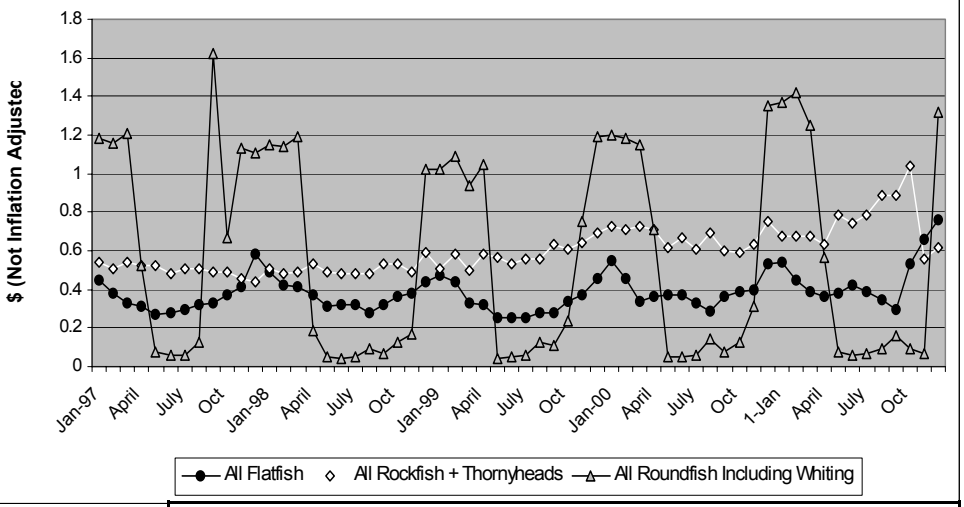


by late fall, with restrictions or closures occurring in the October-December period. In terms of safety, fishery restrictions and closures toward the end of the year when weather conditions are least favorable may be more acceptable. Small vessel operators who might want to have access to groundfish allocations during better weather months might be more adversely affected economically by summer closures than they are by winter closures. However for vessels operating off Southern California, winter weather is generally milder so restrictions during this period may be less important from a safety standpoint.

From the processors perspective, the January 1 start date with early winter restrictions may be economically acceptable because the Dungeness crab and coastal pelagic species (CPS) fishing seasons

tend to be strong in the November through January period. Those fisheries may allow fish processing plants to stay open during an otherwise slow groundfish period. There are also disadvantages, however to a January 1 start date with early winter restrictions and closures for fish marketers. During the November-December period, Americans spend a great deal of money, buying gifts and entertaining friends and family either at home or at restaurants. December holidays and New Year's are also celebrated in other countries with purchases of a wide range of luxury foods. Marketing and export opportunities, particularly to cultures with more fish-oriented diets, may be lost during this potentially lucrative time of year, although studies have shown that export opportunities may be determined as much by relative exchange rates and the availability of competitive substitutes as by the presence of potential markets (Sigel, 1984.).

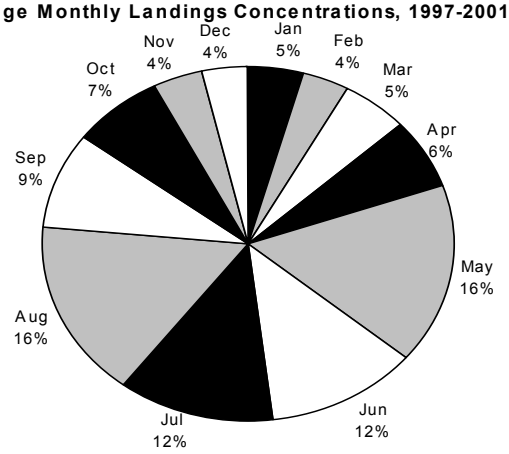
Figure 4.3.3 Price Per Pound for Groundfish Groups, By Month, 1997-2001



Note: Values and Prices in figures in this section not adjusted for inflation. Based on gross domestic product implicit price deflator, $1.00 in 2001 = $ 0.977 in 2000, $0.956 in 1999, $0.942 in 1998, and $0.931 in 1997.

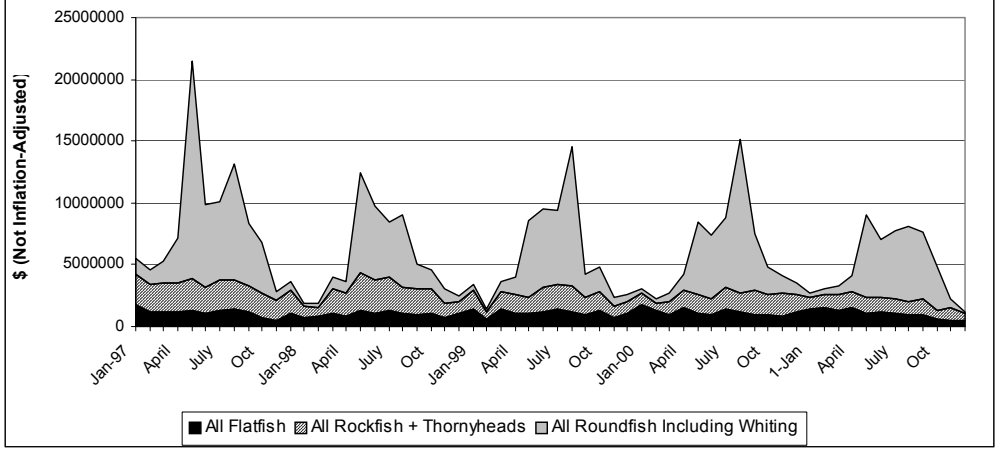
Winter closures may also affect the ability of fishery participants to manage the financial challenges of the holiday season. Like most Americans, groundfish fishery participants could probably better meet those challenges if they were able to increase their incomes during that November-December period. Process Alternatives 1 and 3 have the disadvantage of a fishing period start date that may result in fewer fishing opportunities at a time of year when fishery participants may have a greater need for income. Additionally, Process Alternative 3 could be modified to allow two-year OYs (OY Duration Alternatives 2 or 3,) which could place the slow end-of-period season into the latter half of the second year in a two-year cycle. The August-October period would not result in additional losses of holiday marketing opportunities, but could force the groundfish industry into a more dramatic cycle of openings and closures than under one-year OYs. To counteract this possibility, the Council would need to set conservative management measures at the start of the two-year management cycle.

Figure 4.3.4 Groundfish Landings (Including Whiting,) By Value, Average Monthly Landings Concentrations, 1997-2001



Process Alternatives 2 and 5 are biennial processes with March 1 fishing period start dates. A March 1 start date, with a corresponding February 28/29 ending date could push the restriction and closure period from the status quo October-December to a new December-February period. For processors that focus on Dungeness crab, a slow period in December-February might be more advantageous in northern ports, where crab tends to enter its hardshell phase later than in the south. Processors at the southern end of the Dungeness crab range (central-northern California) would be at a disadvantage because the hardshell phase for crab in their area tends to come in November-December, a time when they might want to continue to accept groundfish landings. On the other hand, CPS fisheries are concentrated in the southern part of the coast and those also operate strongly during the winter months. In terms of safety, a December-February closure probably has no measurable change over an October-December closure. Additionally, a slow December-February period may provide more year-end holiday marketing opportunities than an October-December closure. Conversely, closure in the early part of the calendar year may reduce marketers ability to participate in Asian cultures' celebration of New Years tied to the lunar calendar. Many Asian and Asian-American cultures tend to consume more fish per-capita than other American culture groups, making Asian holiday celebrations important fish-consumption periods. As with Process Alternative 3, setting two-year OYs could result in a long closure period at the end of the second fishing year. Under Process Alternatives 2 and 5, this period would likely occur in October-December, affecting both the groups that would be affected with one-year OYs under Process Alternative 3 and under Alternatives 2 and 5. Again, a more conservative harvest regime at the start of the management period could counteract the end-of-period closures.

Figure 4.3.5 Value of Groundfish Landings By Month, 1997-2001



Process Alternative 4 is a biennial process with a May 1 start date. A May 1 start date, with a corresponding April 30 ending date could push the restriction and closure period from the status quo October-December to a new February-April. This start date could ensure open groundfish fisheries throughout the Dungeness crab season, allowing vessels and processing plants to switch between crab or CPS and groundfish at will. Having a slow groundfish period of February-April, however, might be difficult for West Coast fishery participants trying to fill out their incomes between the Dungeness crab and CPS seasons and the shrimp, salmon and albacore seasons of spring and summer. For vessel safety and small vessel income, Process Alternative 4 is the least advantageous because February-April is the period when small vessels that do not fish during winter are just starting to get back on the water. Many fishers would not want to see a period of management-constrained fishing opportunities following immediately on the heels of a period of weather-constrained periods. Conversely, the knowledge that the fisheries would likely close during the February-April period would push vessel operators to fish during winter weather that they might otherwise avoid, thereby compromising safety. Like the potential December-February slow period associated with a March 1 start date, a February-April slow period associated with May 1 start could also negatively affect producers supplying fish for consumption during Asian and Asian-American New Years celebrations as well as during Lent, a period in the Christian calendar when many persons increase their fish consumption. Similar to all of the other Process Alternatives, the effects of this

alternative would vary according to whether one-year (OY Duration Alternative 1,) two-year (OY Duration Alternative 2,) or mixed (OY Duration Alternative 3) OY periods are used. Without conservative management measures, the lengthy closure period that could be associated with two-year OYs under this alternative would likely occur in December-April. This closure period would affect all of the groups described as affected under Process Alternatives 2 and 5 as well as those affected by the May 1 start date under Process Alternative 4.

A May 1 start date could require reorganization of both tribal and nontribal fishing opportunities for groundfish. The logistics of tribal commercial fishery management under a May 1 start date will be addressed in the next section, along with nontribal commercial fishery logistical concerns. For most tribal fisheries, however, there are also subsistence and ceremonial uses of different fish species. Much of the subsistence fishing by the four groundfish treaty tribes occurs during the March-April tribal commercial halibut and sablefish fisheries. Nontribal groundfish fisheries would need to be managed in a way that would ensure groundfish availability for all tribal commercial, subsistence and ceremonial fisheries during the February-April period.

As with biological effects, many of the potential socio-economic effects of shifting the fishing year start date should more properly be considered effects of the Council's year-round fishery policy, rather than effects of the start date of a management period. Socio-economic effects resulting from different closure periods associated with the alternative season start dates or with one- or two-year OY durations could more accurately be attributed to inadequate tools for the allocation of managed species among user groups and to the lack of management tools that would allow fishery participants access during periods most advantageous to their particular business needs. Ideally, vessel operators and processors should be able to take advantage of whichever seasonal markets best fit their needs. Small vessel operators should not be forced to fish during inclement weather because of concerns about fishery closures during spring and summer months. Vessel operators afforded the privilege of fishing for both Dungeness crab and groundfish, or groundfish and shrimp, should be able to time their fishing trips based on the migratory patterns of their target species and the needs of their own marketing strategies and those of their associated processors. While implementing multi-year groundfish management will not alleviate all season-related management problems for fisheries participants, it should be a positive step toward improving the stability and certainty of seasonal groundfish allocations for participating harvesters and processors. The improved science and management made possible with multi-year planning will help mitigate the closure cycle by stabilizing groundfish allocations and landings throughout the season.

4.3.2 Socio-Economic Effects of the Council and NMFS Public Review Processes

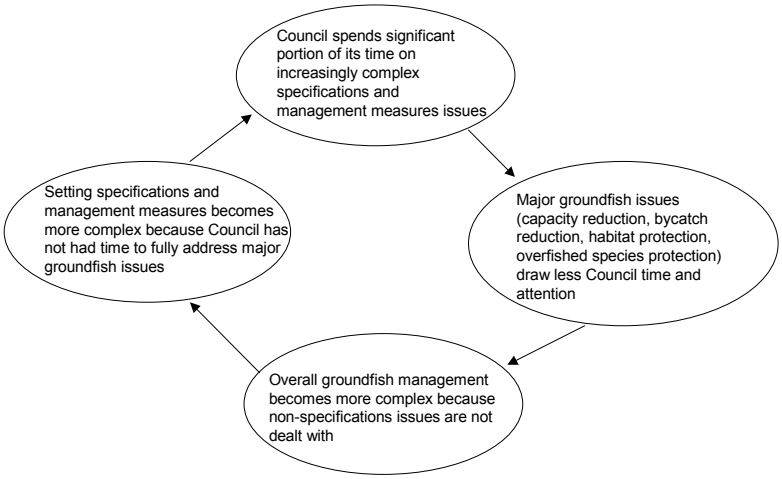
The changes to the Council's specifications and management measures process considered in Amendment 17 will also affect overall Council process and schedule. Each of the alternatives allows more or less Council and NMFS staff work time and uses a different number of Council meetings to achieve the same results. Alternatives that use more Council meetings to develop a specifications and management measures package may be more costly in terms of Council time spent on each issue, but may result in better overall analysis with less Council time spent on correcting mistakes. In addition to issues related to developing the specifications and management measures, changing the Council's process may also alter scheduling for inseason management measures. And, changing the Council meetings at which groundfish issues are considered may also conflict with non-groundfish issues traditionally considered at those meetings. Table 4.3.3 compares these factors across the process alternatives. OY duration would not affect the Council process.

Table 4.3.3 Council process issues under Amendment 17 alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Number of Council meetings needed to develop two years of specifications	4	3	3	3	2
Available time for Council staff and Council advisory committees analysis work	7 months	11-19 months	14 months	9 months	9 months
Available time for NMFS regulations development, publication, & public review period	2 months	5.5 months	6.5 months	6 months	5.5 months
Amount of time between the last Council meeting of the fishing year and the start of the new fishing period. (Inseason measures adjustment period.)	3 months. Inseason changes for Oct-Dec made in Sept, with final check at Nov. meeting.	3 months. Inseason changes for Dec-Feb made in Nov, no new meetings until after 3/1 start date.	3 months. Inseason changes for Oct-Dec made in Sept, with final check at Nov. meeting.	5 months. Inseason changes for Dec-Apr made in Nov, with final check at Mar. meeting.	3 months. Inseason changes for Dec-Feb made in Nov, no new meetings until after 3/1 start date.
Process includes a March or April meeting that could conflict with salmon management process?	No	Yes	Yes	No	No

Under Process Alternative 1 (status quo/no action,) the Council uses the highest number of meetings to develop specifications and management measures for a two-year period. Before setting up the Groundfish Multi-year Management Committee, the Council had decided to use a three-meeting process to develop annual specifications and management measures. With an annual three-meeting process, the Council would have used six meetings to develop specifications and management measures for a two-year period. In general, the Council considers groundfish issues at four out of five meetings per year, with the fifth meeting (March) used only for updates and preparatory discussions. One of the notable process advantages of Process Alternatives 2-5 is that the Council would have an "off" year in which it would not be developing specifications and management measures. During that off year, the Council could use its groundfish meetings to address its notable backlog of long-term groundfish management issues. Under status quo, the Council is stuck in a cycle that forces participants to spend so much time on specifications and management measures development that they are unable to work on issues (like capacity reduction) that could ultimately help to reduce the complexity of the specifications and management measures.

Figure 4.3.6 Council's Groundfish Management Efforts



In addition to varying in the number of meetings that would be used to develop specifications and management measures, the alternatives also vary in the amount of time that they allot for Council staff and Council advisory bodies to

provide background documentation and analysis for the Council's work. Process Alternative 2 provides the longest period (11-19 months,) with the Council's work time dependent on when stock assessments are completed, while the shortest period (7 months) is provided under status quo (Process Alternative 1). The level of analysis and background documentation required in each specifications and management measures process would be based on the factors particular to that year's process and would not vary between alternatives. A disadvantage of the alternatives with shorter periods for background analyses is that these periods are generally only sufficient in years when there are no notable questions about the outcomes of new stock assessments and overfished species rebuilding plans. In developing the 2003 specifications, for example, the Council had to hold emergency stock assessment reviews between its preliminary (June) and final (September) specifications meetings. The results of these reviews had to be folded into the analysis for 2003 specifications and management measures. Conversely, a disadvantage of the alternatives with longer analysis periods is that the analysis becomes farther disconnected in time from the science that was conducted in support of the analysis. Even in the current specifications and management measure process, new information that arises between the completion of stock assessment and the Council's final decisions affects those decisions. With a longer analysis period, there are more opportunities for new information to arise, making both analysis and decisions more complex.

With the exception of status quo, the alternatives are essentially the same in terms of the duration of time allowed for NMFS to draft proposed implementing regulations, receive public comment, respond to that comment and draft final implementing regulations. The minimum time needed to complete this process is 5 months from the Council's final recommendation on specifications and management measures. The status quo process was revised for 2003 to ensure adequate opportunity for public review of and comment on the specifications and management measures regulatory package. Under the 2003 process, NMFS expects to implement an emergency rule for January-February 2003 management measures, and publish an associated proposed rule for the complete 2003 specifications and management measures package. The agency expects to publish the final rule for the 2003 specifications and management measures by March 1, 2003. This emergency/proposed rule process could not be used on a regular basis, as emergency rules are intended for emergencies, not planned-for events.

All of the alternatives, except for Process Alternative 4, has three months between the last Council meeting at which an inseason action may be recommended and the start of the new fishing year/period. Under Process Alternatives 1 and 3, the Council would be able to make inseason adjustments at its September meeting for the October-December period. The November Council meeting is usually not useful for making inseason adjustments, as those adjustments could only affect the month of December. Groundfish fishing activity tends to be slow in December, so there is little that the Council can change for December that will have much effect on the overall landings patterns for the year. Under Process Alternatives 2 and 5, the Council would be able to make inseason adjustments at its November meeting for the December-February period. Unlike Process Alternatives 1 and 3, the Council would not have an interim meeting for last-month checks on landings levels. With Process Alternative 4, the November Council meeting would also be the last Council meeting at which the Council could make inseason adjustments before the start of the new fishing period. Process Alternative 4 features a May 1 start date, which means that the Council could make last-month changes at its March meeting, but those would not take effect until the last month of the fishing period. As with Process Alternatives 1 and 3, adjustments made in the last month of the fishing period could not be expected to notably alter the overall landings patterns for the year. If the Council were to adopt Process Alternative 4, it may also have to set up a process that would allow either NMFS or a telephone conference of Council representatives to make inseason adjustments as needed during the December-April period.

Similar to the annual groundfish management cycle, the annual salmon management cycle is a carefully orchestrated set of meetings, all carefully timed to use up-to-date information and agreements in setting the new year's management measures. The Council addresses annual salmon management measures at its March (proposed) and April (final) meetings. To ensure that the Council is fully able to concentrate on salmon issues, the March meeting has traditionally had few to no groundfish items on its agenda. The Council's groundfish advisory bodies, the GMT and the GAP, do not meeting during the March meeting.

Although groundfish issues are on the Council's April meeting agendas and the GMT and GAP meet during the Council's April meeting, groundfish issues dealt with in April also tend to be less rigorous than those dealt with in June, September, and November. Process Alternative 2 and 3 both include a March or April meeting in the specifications and management measures development process. If the Council is to include specifications and management measures development in a March or April meeting, it will likely have to ensure that it addresses no other groundfish issues during those meetings, so that it may continue to devote the bulk of its attention to salmon management.

In addition to these longer term issues, there are several short-term logistical issues associated with changing the fishing year start date that could affect the Council process and its participants. If the Council chooses either Process Alternative 1 or 3, the fishing period start date of January 1 would remain the same. Process Alternatives 2 and 5 have a March 1 fishing year start date. To shift from a January 1 to March 1 start date, the Council and NMFS would need to create separate ABCs/OYs and management measures for the January/February period of the transition year, followed by a new set of specifications and management measures for the March 1 - February 28/29 period following the transition period. [Note: Transition scenarios for Process Alternatives 3 (Council preferred) and 5 (SSC recommended) are presented in Appendix B.] Similarly, the Process Alternative 4 May 1 start date would require a four month transitional set of ABCs/OYs and management measures. Shifting to the May 1 start date of Process Alternative 4 would also require that the Council make arrangements for accommodating the current management structure of the tribal commercial halibut/sablefish fisheries, the non-tribal primary fixed gear sablefish fishery, and the shorebased primary whiting season south of 42° N. lat. Table 4.3.4 examines some of the transitional issues that might have to be addressed for each of these fisheries under an Process Alternative 4 May 1 start date.

Table 4.3.4 Logistical Issues for Period-Defined Fisheries Associated with a May 1 Start Date

Fishery	Issues to be Addressed in Transition to May 1 Start Date
Tribal Halibut/Sablefish Fisheries	The bulk of tribal groundfish fishing occurs in March/April, concurrent with the major halibut and sablefish fisheries. Process Alternative 4 would not affect the tribal halibut fisheries. If the tribal sablefish fisheries were set to take their entire sablefish allocation during the March/April period, a May 1 start date would also not affect those fisheries. The tribal sablefish allocation is set at the beginning of the fishing period and the period when it is taken is not affected by the activities of the non-tribal fisheries. However, under Process Alternative 4, fishing activities beyond May 1 would be conducted against new ABCs/OYs and allocations. Should the tribes wish to hold a sablefish season that began in March and lasted through April and into May or beyond, the tribes and the Council would have to discuss how to best manage tribal harvests against two different allocations within a single tribal management period. It would be impractical for the tribes to move their fisheries earlier than March both because their groundfish fisheries are managed in concert with their halibut fisheries (which have a fishing period start date controlled by an international commission,) and because tribal fisheries operate off of northern Washington and rough weather in this northern area tends to prevent many tribal and non-tribal vessels from operating during winter months.
Limited Entry Fixed Gear Primary Sablefish Fishery	Amendment 14 to the FMP set the limited entry fixed gear primary sablefish season at April 1 through October 31. In order to maintain an April-October season within the May-April fishing period specified in Process Alternative 4, the Council would have to create two fishing seasons for each year: one held from May 1 through October 31 and a second season held from April 1 through April 30. At the May 1 start date, fishing could commence on the new period's sablefish ABC/OY. Alternatively, the Council could decide to shorten the primary sablefish season to May-October in order to eliminate the complexity of running two back-to back seasons fishing against different ABCs/OYs. This latter alternative may prove unpopular given the many years this fleet has invested in moving their management regime from a brief derby fishery to a longer season with more safety and flexibility for participants.
Primary Whiting Season South of 42° N. lat.	Opening dates for the non-tribal shorebased whiting season differ by area. In 2002, the shorebased fishery between 42° N. lat. and 40°30' N. lat. opened on April 1 and the shorebased fishery south of 40°30' N. lat. opened on April 15. North of 42° N. lat., the fishery opened on May 15. If the Council were to implement a May 1 start date through Amendment 17, it would likely also have to formalize a percentage of the shorebased whiting fishery allocation to be set aside for harvesting in April. Under Process Alternative 4, April would be the end of the overall fishing period. Without a set aside for the southern shorebased whiting fisheries, the shorebased whiting allocation would likely be taken in the earlier part of the fishing period (May-August). April openings are set for the southern shorebased fleet to allow that fleet to take advantage of whiting's springtime migration northward. Moving the fishing period start date for the southern whiting fishery would be impractical because later dates could prevent southern vessels and processors from accessing whiting as it migrates through their waters.

4.4 Cumulative Effects

Cumulative effects must be considered when evaluating the alternatives to the issues considered in the EA. Cumulative impacts are those combined effects on quality of the human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what Federal or non-Federal agency or person undertakes such other actions (40 CFR 1508.7, 1508.25(a), and 1508.25(c)).

For the issues considered in this document, the geographic area that would be affected by this action is the U.S. West Coast EEZ. Potential direct and indirect effects of the preferred and other alternatives to the specifications and management measures issue and to the OY duration issue are detailed above and summarized in Tables 4.2.1 and 4.3.1.

Of the past, proposed, and reasonably foreseeable future actions that are expected to also affect these same waters, the most notable is the action to implement Pacific Coast groundfish fishery management measures for 2003. For 2003, large-scale depth-based restrictions for fishing across much of the continental shelf were adopted and are intended to further the conservation goals and objectives of the FMP by allowing fishing to continue in areas and with gears that can harvest healthy stocks with little incidental catch of low abundance species. The effects of the 2003 groundfish specifications and management measures have been described and analyzed in a Final Environmental Impact Statement (EIS) prepared by the Council staff. This action would not affect the 2003 specifications and management measures, although it would revise the development process for specifications and management measures for 2005 and beyond. For those years, this action would provide the Council and NMFS more time to develop and review the specifications and management measures, and more time for the public to review and comment upon the regulatory package. To the extent that this action provides more time for managers to carefully consider the complex specifications and management measures harvest regulations package, this action in combination with future specifications and management measures actions will have positive effects on the environment.

Amendment 16 to the FMP will specify the required contents of rebuilding plans and defines species specific rebuilding plans. This proposed action will support rebuilding measures over time by providing scientists who support the Council's management process with more time to develop and revise overfished species rebuilding plans, and by providing NMFS, the Council, and the public more time to review and comment upon those rebuilding plans.

One of the Council's motivations for considering multi-year management was to free up Council time from the annual process of developing and considering the specifications and management measures harvest regulations package. To the extent that this action does free up Council and NMFS time, the Council expects to devote some of its work time to actions that would reduce overcapacity in the fishery. The long-term effects of this action would then be to provide managers with time and opportunity to consider the complex task of reducing capacity in the groundfish fisheries, which would ultimately have positive effects on the environment affected by this action.

Table 4.4.1 – Expected effects of preferred alternatives if effects accumulate over time	
Issue/Alternative	**Expected effects**
Issue 1, Alternative 3 (preferred): biennial management with November/April/June Council process and January 1 start date	Preferred alternative would revise specifications and management measures process so that: these harvest regulations are set for a two-year period, the Council process would occur over the November/April/June meetings prior to the start of the management period; and, the fishing year would start on January 1. Over time, these changes are only expected to have effects on the environment to the extent that they open Council and NMFS schedules to address issues other than the burdensome specifications and management measures.
Issue 2, Alternative 1 (preferred): Two one-year OYs for all species managed under the biennial process.	Preferred alternative would require that the Council and NMFS continue to set Optimum Yields for each year, rather than for each biennium. Over the short term, this action is expected to prevent wild fluctuations in management measures between the two years in each management biennium. Over the long term, more stability in management measure between years is expected to reduce fisher frustration with frequency and magnitude of changes to management actions, but is otherwise not expected to have any long-term effects on the environment.

Table 4.4.2 Direct & indirect impacts of all Issue 1 alternatives if effects accumulate over time					
Issue 1 – Management Process	Alternative 1 Status Quo, Annual Process, June/Sept Council meetings, Jan 1 start date	Alternative 2 Biennial Process, Apr/June/Sept Council meetings, March 1 start date	Alternative 3 Biennial Process, Nov/Apr/June Council meetings, Jan 1 start date	Alternative 4 Biennial Process, June/Sept/Nov Council meetings, May 1 start date	Alternative 5 Biennial Process, June/Sept Council meetings, March 1 start date
Groundfish Species					
Effect on sustainability	N	N	N	N	N
Prey availability	N	N	N	N	N
Habitat	N	N	N	N	N
Non-groundifsh fish species including: CPS, forage fish, prohibited					
Incidental take -Effect on sustainability	N	N	N	N	N
Prey availability	N	N	N	N	N
Habitat	N	N	N	N	N
ESA listed Salmonids					
Incidental take -Effect on sustainability	N	N	N	N	N
Prey availability	N	N	N	N	N
Habitat	N	N	N	N	N
Marine mammals	N	N	N	N	N
Incidental take -Effect on sustainability	N	N	N	N	N
Prey availability	N	N	N	N	N
Habitat	N	N	N	N	N
Seabirds					
Incidental take -Effect on sustainability	N	N	N	N	N
Prey availability	N	N	N	N	N
Habitat	N	N	N	N	N
Sea Turtles					
Incidental take -Effect on sustainability	N	N	N	N	N
Prey availability	N	N	N	N	N
Habitat	N	N	N	N	N
Marine Habitat					
Damage to biota	N	N	N	N	N

Table 4.4.2 Direct & indirect impacts of all Issue 1 alternatives if effects accumulate over time					
Issue 1 – Management Process	Alternative 1 Status Quo, Annual Process, June/Sept Council meetings, Jan 1 start date	Alternative 2 Biennial Process, Apr/June/Sept Council meetings, March 1 start date	Alternative 3 Biennial Process, Nov/Apr/June Council meetings, Jan 1 start date	Alternative 4 Biennial Process, June/Sept/Nov Council meetings, May 1 start date	Alternative 5 Biennial Process, June/Sept Council meetings, March 1 start date
Damage to benthic habitat	N	N	N	N	N
Impacts on related non-groundfish fisheries					
Direct effect on state managed fisheries	N	N	N	N	N
Direct effect on tribal managed fisheries	N	N	N	N	N
Direct effect of federally managed fisheries	N	N	N	N	N
Socio-economic factors					
Harvesters	N	N	N	N	N
Processors	N	N	N	N	N
Fish prices	N	N	N	N	N
Ex-vessel value to industry	N	N	N	N	N
Safety of human life	N	N	N	N	N
Management and Enforcement	N	N	N	N	N
Costs to consumers	N	N	N	N	N
Communities	N	N	N	N	N

N=nonsignificant impact expected S=significant impact either positive (+) or negative (-) U=unknown

Table 4.4.3 Direct & indirect impacts of all Issue 2 alternatives if effects accumulate over time			
Issue 2 – OY Duration	Alternative 1 Status Quo, One-Year OYs, Two per Biennium	Alternative 2 Two-Year OYs, One per Biennium	Alternative 3 Mixture of One-Year and Two-year OYs, by species, within Biennium
Groundfish Species			
Effect on sustainability	N	N	N
Prey availability	N	N	N
Habitat	N	N	N
Non-groundifsh fish species including: CPS, forage fish, prohibited species, and unlisted			
Incidental take -Effect on sustainability	N	N	N
Prey availability	N	N	N
Habitat	N	N	N
ESA listed Salmonids			
Incidental take -Effect on sustainability	N	N	N
Prey availability	N	N	N
Habitat	N	N	N
Marine mammals	N	N	N
Incidental take -Effect on sustainability	N	N	N
Prey availability	N	N	N
Habitat	N	N	N
Seabirds			
Incidental take -Effect on sustainability	N	N	N
Prey availability	N	N	N
Habitat	N	N	N
Sea Turtles			
Incidental take -Effect on sustainability	N	N	N

Table 4.4.3 Direct & indirect impacts of all Issue 2 alternatives if effects accumulate over time			
Issue 2 – OY Duration	Alternative 1 Status Quo, One-Year OYs, Two per Biennium	Alternative 2 Two-Year OYs, One per Biennium	Alternative 3 Mixture of One-Year and Two-year OYs, by species, within Biennium
Prey availability	N	N	N
Habitat	N	N	N
Marine Habitat			
Damage to biota	N	N	N
Damage to benthic habitat	N	N	N
Impacts on related non-groundfish fisheries			
Direct effect on state managed fisheries	N	N	N
Direct effect on tribal managed fisheries	N	N	N
Direct effect of federally managed fisheries	N	N	N
Socio-economic factors			
Harvesters	N	N	N
Processors	N	N	N
Fish prices	N	N	N
Ex-vessel value to industry	N	N	N
Safety of human life	N	N	N
Management and Enforcement	N	N	N
Costs to consumers	N	N	N
Communities	N	N	N

N=nonsignificant impact expected S=significant impact either positive (+) or negative (-) U=unknown

5.0 CONSISTENCY WITH FMP AND OTHER APPLICABLE LAW

5.1 Magnuson-Stevens Conservation and Management Act

The Magnuson-Stevens Act provides parameters and guidance for federal fisheries management, requiring that the Councils and NMFS adhere to a broad array of policy ideals. Overarching principles for fisheries management are found in the Act's National Standards. In crafting fisheries management regimes, the Councils and NMFS must balance their recommendations to meet these different national standards.

National Standard 1 requires that "Conservation and management measures shall prevent overfishing while achieving on a continuing basis, the optimum yield from each fishery for the United States fishing industry." Amendment 17 is administrative in nature and would affect neither the prevention of overfishing nor the achievement of optimum yield.

National Standard 2 requires the use of the best available scientific information. As discussed above in Section 4.2 and detailed in Table 4.2.2, the alternative specifications and management measures processes (Issue 1) would vary in the speed with which information from resource surveys is used in fisheries management. While the status quo/no action process alternative would result in the swiftest incorporation of survey information into management for one-third of all assessed stocks, the biennial management processes (Process Alternatives 2-5) would provide stock assessment scientists with more opportunities to improve the overall quality of groundfish science. Process Alternative 3 (Council preferred) uses resource survey data in fisheries management more swiftly than Alternative 2 and less swiftly than Alternatives 4 and 5. However, Process Alternative 3 provides stock assessment scientists with more time to complete the assessments than Alternatives 4 or 5, possibly resulting in better quality stock assessments. Process Alternative 3 differs from the swiftest data use alternative (Process Alternative 5) in the timing of survey data use by ten months. For each alternative, there is a trade-off between use of most recently available data and opportunity to improve the quality of scientific information needed for the management process. The OY Durations Alternatives (Issue 2) do not differ in their use of the best available science in the setting of the OYs. Two-year OYs (OY Duration Alternatives 2 or 3,) however, may provide more flexibility in responding to scientific information for inseason management than one-year OYs (Alternative 1).

National Standard 3 would not be affected by the proposed actions because they do not address whether individual stocks of fish are managed as a unit throughout their ranges, or whether interrelated stocks of fish are managed as a unit.

National Standard 4 requires that "Conservation and management measures shall not discriminate between residents of different States." All alternatives meet this standard

National Standard 5 is not affected by the proposed actions because none of the alternatives would affect the Council's ability to improve or alter efficiency in the utilization of fishery resources. Under Issue 1, however, the preferred alternative (Process Alternative 3) would provide the Council and NMFS with more time to address efficiency issues in the groundfish fishery than under status quo.

National Standard 6 is not affected by the proposed actions because none of the alternatives would affect the Council's ability to take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

National Standard 7 requires that "Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication." The biennial management measures processes proposed in Alternatives 2-5 would all reduce cost and duplication over the status quo/no action alternative of an annual specifications and management measures process. Alternatives 2-4 (Alternative 3 is preferred) include higher costs than Alternative 5 because they are 3-meeting Council processes for developing specifications and management measures, rather than a 2-meeting Council process.

National Standard 8 requires that “conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities." Fishing communities could be negatively affected by the biennial management processes (Process Alternatives 2-5) if the Council were to manage with two-year OYs (OY Duration Alternatives 2 or 3), rather than with two one-year OYs (Council-preferred OY Duration Alternative 1). In recent years, the Council has had to shut down large sectors of the fisheries 4-6 months before the end of the fishing year. If two-year OYs were implemented through a biennial management alternative, incautious management regimes in the first fishing year could result in overharvest and a complete fishery shut-down the second fishing year. Amendment 17 itself is administrative in nature and would not create a fishery shutdown, but management actions taken during the specifications and management measures process altered by Amendment 17 could certainly affect fishing communities.

National Standard 9 would not be affected by the proposed actions because Amendment 17 is administrative in nature does not affect the Council’s ability to address the reduction of bycatch or bycatch mortality. Under Issue 1, however, the preferred alternative (Process Alternative 3) would provide the Council and NMFS with more time to address bycatch reduction issues in the groundfish fishery than under status quo.

National Standard 10 would not be affected by the proposed actions because Amendment 17 is administrative in nature does not affect the Council’s ability to promote the safety of human life at sea.

Amendment 17 is administrative in nature and is intended to alter the schedule by which the Council and NMFS develop and consider specifications and management measures; therefore, none of the alternatives are expected to have any effects (positive or negative) on essential fish habitat (EFH.)

5.2 Consistency with the FMP

Similar to the Magnuson-Stevens Act National Standard guidelines, the goals and objectives of the FMP are intended to provide a philosophical framework to guide the Council’s decisions. Amendment 17 is intended to revise the process by which the Council considers the groundfish specifications and management measures. Amendment 17 does not revise the guiding principles of the FMP. None of the Amendment 17 alternatives to either Issue 1 (Process) or Issue 2 (OY Duration) are counter to any of the goals or objectives or the FMP, nor would the alternatives analyzed herein prevent the Council from managing the fishery with those goals and objectives in mind. Of the FMP’s goals and objectives, only Objective 15, a “Social Factors” objective, may be affected by Amendment 17 deliberations.

> Objective 15. When considering alternative management measures to resolve an issue, choose the measure that best accomplishes the change with the least disruption of current domestic fishing practices, marketing procedures, and the environment.

Alternatives 2, 4, and 5 all would change the start date of the fishing year. Fishery participants have expressed a desire to continue with the current management practice of a January 1 fishing year start date (Alternatives 1 and 3). Thus, Alternative 3 would be more consistent with Objective 15 than the other biennial process alternatives.

Objective 1, a “Conservation” objective calls for maintaining “an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.” This is similar to Magnuson-Stevens Act National Standard 2, which requires the use of the best available scientific information. Amendment 17 would not disrupt the information flow that is currently used in setting specifications and management measures and in revising management measures inseason. As discussed above for National Standard 2, each of the process alternatives provides a different time lag between when resource surveys are conducted and when the data from those surveys is used to support

management for a fishing period.

Objective 17, another "Social Factors" objective is essentially the same as National Standard 8. It states, "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." And, as discussed at National Standard 8, above, the effect of a biennial management process on fishing communities depends mainly on the particular specifications and management measures developed for any one fishery management period.

FMP amendatory language for Amendment 17 is provided in Appendix A. This amendatory language describes new terms, like "biennial fishing period" and the biennial management process. Because the FMP directs the activities and procedures of the Council, which is not a scientific body, the FMP does not detail the scientific process associated with the biennial management process. As groundfish data availability improves, the biennial science process may also change to take better advantage of that data. NMFS and the states, which conduct the stock assessments, will continue to cooperate with the Council in providing stock assessments on a schedule appropriate to the management process. Under Amendment 17 preferred Process Alternative 3, the FMP would be amended to specify a biennial management process with a January 1 fishing year start date and three Council meetings to develop the specifications and management measures. The FMP would not, however, specifically tie the Council to using a November-April-June meeting process, should future management needs change in a way that the Council also needs to revise its calendar.

5.3 Paperwork Reduction Act

None of the alternatives require collection-of-information subject to the PRA.

5.4 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) of 1972 is the principle federal legislation that guides marine mammal species protection and conservation policy in the United States. Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of whales, dolphins, porpoise, as well as seals, sea lions, and fur seals while the FWS is responsible for walrus, sea otters, and the West Indian manatee.

Off the West Coast, the Steller sea lion (*Eumetopias jubatus*) Eastern stock, Guadalupe fur seal (*Arctocephalus townsendi*), and Southern sea otter (*Enhydra lutris*) California stock are listed as threatened under the ESA and the sperm whale (*Physeter macrocephalus*) Washington, Oregon, and California (WOC) Stock, humpback whale (*Megaptera novaeangliae*) WOC - Mexico Stock, blue whale (*Balaenoptera musculus*) Eastern north Pacific stock, and Fin whale (*Balaenoptera physalus*) WOC Stock are listed as depleted under the MMPA. Any species listed as endangered or threatened under the ESA is automatically considered depleted under the MMPA.

The West Coast groundfish fisheries are considered a Category III fishery, indicating a remote likelihood of or no known serious injuries or mortalities to marine mammals, in the annual list of fisheries published in the Federal Register. Based on its Category III status, the incidental take of marine mammals in the West Coast groundfish fisheries does not significantly impact marine mammal stocks. Amendment 17 is administrative in nature and would not change the effects of the groundfish fisheries on marine mammals.

5.5 National Environmental Policy Act (NEPA)

This EA is intended to meet the NEPA requirements that apply to the proposed action.

5.6 Endangered Species Act

NMFS issued Biological Opinions under the ESA on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999 pertaining to the effects of the groundfish fishery on chinook salmon (Puget Sound, Snake River spring/summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central

Valley spring, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal), chum salmon (Hood Canal summer, Columbia River), sockeye salmon (Snake River, Ozette Lake), and steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, northern California, southern California). During the 2000 Pacific whiting season, the whiting fisheries exceeded the chinook bycatch amount specified in the Pacific whiting fishery Biological Opinion's (December 15, 1999) incidental take statement estimate of 11,000 fish, by approximately 500 fish. In the 2001 whiting season, however, the whiting fishery's chinook bycatch was about 7,000 fish, which approximates the long-term average. After reviewing data from, and management of, the 2000 and 2001 whiting fisheries (including industry bycatch minimization measures), the status of the affected listed chinook, environmental baseline information, and the incidental take statement from the 1999 whiting BO, NMFS determined in a letter dated April 25, 2002 that a re-initiation of the 1999 whiting BO was not required. NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. This action is within the scope of these consultations.

5.7 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act (CZMA) of 1972 requires all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The proposed alternative would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination has been submitted to the responsible state agencies for review under section 307(c)(1) of the Coastal Zone Management Act (CZMA). The relationship of the groundfish FMP with the CZMA is discussed in Section 11.7.3 of the groundfish FMP. The groundfish FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs. The recommended action is consistent and within the scope of the actions contemplated under the framework FMP.

Under the CZMA, each state develops its own coastal zone management program which is then submitted for federal approval. This has resulted in programs which vary widely from one state to the next. Because the intent of Amendment 17 is administrative in nature -- to alter the schedule by which the Council and NMFS develop and consider specifications and management measures -- none of the alternatives are expected to affect any state's coastal management program.

5.8 Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments

Executive Order 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

The Secretary of Commerce recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. At Section 302(b)(5), the Magnuson-Stevens Act reserves a seat on the Council for a representative of an Indian tribe with Federally recognized fishing rights from California, Oregon, Washington, or Idaho.

The U.S. government formally recognizes that the four Washington Coastal Tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish. In general terms, the quantification of those rights is 50 percent of the harvestable surplus of groundfish available in the tribes' usual and accustomed (U and A) fishing areas (described at 50 CFR 660.324). Each of the treaty tribes has the discretion to administer their fisheries and to establish their own policies to achieve program objectives. Accordingly, tribal allocations and regulations have been developed in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus.

None of the alternatives under consideration for Amendment 17 would affect tribal groundfish allocations. As discussed above in Section 4.0, changing the start date of the fishing period from the current January 1 start date could affect tribal management activities for the halibut and groundfish fisheries. The major tribal groundfish and halibut seasons occur in March and April. A fishing year start date of March 1 (Alternatives 2 and 5) would shorten the time between the NOAA approval of groundfish harvest specifications and the start date of tribal fisheries, which could cause logistical challenges for tribal fisheries managers setting season start dates and harvest amounts. Alternative 4, which includes a May 1 fishing period start date, would set the March-April tribal groundfish and halibut fisheries at the end of the Council's fishing period. While this fishing period start date would provide tribal fisheries managers with more advance notice of available groundfish harvest amounts, there could be greater logistical challenges under Alternative 4 if the treaty tribes wished to change their current management practices to extend the tribal fisheries from the current March-April into a March-May or April-May season. None of the alternatives would affect the halibut fishery management schedule, which is determined by the International Pacific Halibut Commission, and which has traditionally had an annual fisheries start date on or around March 15.

5.9 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished populations of many native bird species. The Act states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The Migratory Bird Treaty Act prohibits the directed take of seabirds, but the incidental take of seabirds does occur. Amendment 17 is administrative in nature and none of the proposed management alternatives, or the Council recommended action are likely to affect the incidental take of seabirds protected by the Migratory Bird Treaty Act.

5.10 Executive Order 12898 – Environmental Justice

Executive Order 12898 obligates federal agencies to identify and address "disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the United States" as part of any overall environmental analysis associated with an action. NOAA guidance, NAO 216-6, at §7.02, states that "consideration of E.O. 12898 should be specifically included in the NEPA documentation for decisionmakng purposes." Agencies should also encourage public participation—especially by affected communities—as part of a broader strategy to address environmental justice issues.

The environmental justice analysis must first identify minority and low-income groups that live in the project area and may be affected by the action. Typically, census data are used to document the occurrence and distribution of these groups. Agencies should be cognizant of distinct cultural, social, economic or occupational factor that could amplify the adverse effects of the proposed action. (For example, if a particular kind of fish is an important dietary component, fishery management actions affecting the availability or price of that fish could have a disproportionate effect.) In the case of Indian tribes, pertinent treaty or other special rights should be considered. Once communities have been identified and characterized and potential adverse impacts of the alternatives are identified, the analysis must determine whether these impacts are disproportionate. Because of the context in which environmental justice developed, health effects are usually considered and three factors may be used in an evaluation: whether the effects are deemed significant, as the term is employed by NEPA; whether the rate or risk of exposure to the effect appreciably exceeds the rate for the general population or some other comparison group; and whether the group in question may be affected by cumulative or multiple sources of exposure. If disproportionately high adverse effects are identified, mitigation measures should be proposed. Community input into appropriate mitigation is encouraged.

Amendment 17 is not expected to affect minority and low-income communities. West Coast groundfish tribes are part of the Council's decision-making process on groundfish management issues and tribes with treaty rights to salmon, groundfish, or halibut have a seat on the Council. None of the revisions to the

FMP under Amendment 17 preferred alternatives affect treaty tribal groundfish allocations or the timing or management flexibility of any of the tribal fisheries for groundfish. West Coast groundfish fisheries are described in Section 3.3 of this document, with more detail provided in the Council's 2003 EIS for the groundfish specifications and management measures (Council 2003). Available demographic data detailed in the EIS show that coastal counties where fishing communities are located are variable in terms of social indicators like income, employment, and race and ethnic composition. Generally, the preferred alternatives are intended to maintain current fishing practices and schedules while improving Council and NMFS efficiency in implementing specifications and management measures. Thus, Amendment 17 is not expected to have notable effects on fishing communities in general, nor on minority and low income groups in particular.

5.11 Executive Order 13132 – Federalism

Executive Order 13132 enumerates eight "fundamental federalism principles." The first of these principles states "Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people." In this spirit, the Executive Order directs agencies to consider the implications of policies that may limit the scope of or preempt states' legal authority. Preemptive action having such "federalism implications" is subject to a consultation process with the states; such actions should not create unfunded mandates for the states; and any final rule published must be accompanied by a "federalism summary impact statement."

The Council and process offers many opportunities for states (through their agencies, Council appointees, consultations, and meetings) to participate in the formulation of management measures. This process encourages states to institute complementary measures to manage fisheries under their jurisdiction that may affect federally managed stocks.

None of the proposed changes to the Plan would have federalism implications subject to EO 13132.

6.0 REGULATORY IMPACT REVIEW AND REGULATORY FLEXIBILITY ANALYSIS

The RIR and IRFA analyses have many aspects in common with each other and with EAs. Much of the information required for the RIR and IRFA analysis has been provided above in the EA. Table 6.1 identifies where previous discussions relevant to the EA and IRFA can be found in this document. In addition to the information provided in the EA, above, a basic economic profile of the fishery is provided annually in the Council's SAFE document.

Table 6.0 1 Regulatory Impact Review and Regulatory Flexibility Analysis

RIR Elements of Analysis	Corresponding Sections in EA	IRFA Elements of Analysis	Corresponding Sections in EA
Description of management objectives	1.2 & 1.3	Description of why actions are being considered	1.2 & 1.3
Description of the Fishery	3.3	Statement of the objectives of, and legal basis for actions	1.2
Statement of the Problem	1.0	Description of projected reporting, recordkeeping and other compliance requirements of the proposed action	4.3
Description of each selected alternative	2.2 & 2.3	Identification of all relevant Federal rules	5.0
An economic analysis of the expected effects of each selected alternative relative to status quo	4.3		

6.1 Regulatory Impact Review

The RIR is designed to determine whether the proposed action could be considered a "significant regulatory action" according to E.O. 12866. E.O. 12866 tests requirements used to assess whether or not an action would be a "significant regulatory action", and identifies the expected outcomes of the proposed management alternatives. An action may be considered "significant" if it is expected to: 1) Have a annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities;2) Create a serious inconsistency or otherwise interfere with action taken or planned by another agency; 3) Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or 4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive Order. Based on the economic analyses found in Sections 4.2 and 4.3, this action is not significant under E.O. 12866.

Requirements of an IRFA

The Regulatory Flexibility Act (5 U.S.C. 603) states that:
(b) Each initial regulatory flexibility analysis required under this section shall contain--

(1) a description of the reasons why action by the agency is being considered:
(2) a succinct statement of the objectives of, and legal basis for, the proposed rule;
(3) a description of and, where feasible, and estimate of the number of small entities to which the proposed rule will apply;
(4) a description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
(5) an identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

(c) Each initial regulatory flexibility analysis shall also contain a description of any significant alternatives to the prosed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives such as--

(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
(2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
(3) the use of performance rather than design standards; and
(4) an exemption from coverage of the rule, or any part thereof, for such small entities.

6.2 Initial Regulatory Flexibility Analysis

When an agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an Initial Regulatory Flexibility Analysis (IRFA) that describes the impact on small businesses, non-profit enterprises, local governments, and other small entities. The IRFA is to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities. To ensure a broad consideration of impacts on small entities, NMFS has prepared this IRFA without first making the threshold determination whether this proposed action could be certified as not having a significant economic impact on a substantial number of small entities. NMFS must determine such certification to be appropriate if established by information received in the public comment period.

1) A description of the reasons why the action by the agency is being considered.
Since 1990, the Council has annually developed its recommendations for specifications and management measures in a two-meeting process (usually its September and November meetings) followed by a NMFS final action published in the Federal Register and made available for public comment and correction after the effective date of the action. In 2001, NMFS was challenged on this process in Natural Resources Defense Council, Inc. v. Evans, 2001 168 F.Supp. 2d 1149 (N.D. Cal. 2001) and the court ordered NMFS

to provide prior public notice and allow public comment on the annual specifications. Because of this court order, the Council needs to amend the FMP's framework for developing annual specifications and management measures to incorporate NMFS publication of a proposed rule for the specifications and management measures, followed by a public comment period and a final rule.

In addition to needing to revise the notice and comment procedure associated with the specifications and management measures, the Council wished to take a new look at efficiency in the annual management process. Groundfish management workload levels have grown in recent years, particularly those associated with setting annual harvest levels for both depleted and healthy stocks. Because of the increasing workload associated with developing specifications and management measures, the Council and NMFS have had less time for addressing many other important groundfish fishery management issues. NMFS has recently asked all of the fishery management councils to consider how they might streamline their processes for developing regulatory recommendations. To meet this NMFS request, the Council decided to consider whether specifications and management measures could be published for multi-year, rather than single year, periods.

NMFS Guidance on RFA

NMFS has provided guidance as to how the regulatory flexibility analysis relates to other analyses and other applicable law. (source: "Operational Guidelines, Fishery Management Plan Process" National Marine Fisheries Service, Silver Spring MD, March 1, 1995, Appendix I.2.d.)

> "The RFA requires that the agency identify and consider alternatives that minimize the impacts of a regulation on small entities, but it does not require that the agency select the alternative with the least net cost. Section 606 of the RFA clearly states that the requirements of a regulatory flexibility analysis do not alter standards otherwise applicable by law. Executive Order 12866 requires that agencies provide an assessment of the potential costs and benefits of a "significant" action, including an explanation of the manner in which the regulatory action is consistent with a statutory mandate and, to the extent permitted by law, promotes the President's priorities and avoids undue interference with State, local, and tribal governments in the exercise of their governmental function (section 6(a)(3)(B)(ii)). However, the Executive Order also requires agencies to adhere to the requirements of the RFA and other applicable law (section 6(a)(3)). In short, when either the regulatory flexibility analysis or the RIR conflict with a statutory mandate (e.g., the Magnuson Act), the resulting decision must conform to the *statute."*

2) A succinct statement of the objectives of, and legal basis for, the proposed rule.

The U.S. groundfish fisheries in the EEZ off the Washington, Oregon, and California coasts are managed pursuant to the Magnuson- Stevens Act and the Pacific Coast Groundfish FMP. The FMP was developed by the Council. Regulations implementing the FMP appear at 50 CFR part 660 subpart G. The rule implementing this action would comply with a court order in Natural Resources Defense Council, Inc. v. Evans, 2001 168 F.Supp. 2d 1149 (N.D. Cal. 2001).

3) A description of and, where feasible, and estimate of the number of small entities to which the proposed rule will apply;

Under the RFA, the term "small entities" includes small businesses, small organizations, and small governmental jurisdictions.

Small businesses. The SBA has established size criteria for all major industry sectors in the US including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts not in excess of $3.5 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $3.5 million criterion for fish harvesting

operations. A wholesale business servicing the fishing industry is a small businesses if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. For marinas and charter/party boats, a small business is one with annual receipts not in excess of $5.0 million.

Approximately 2,000 vessels participate in the West Coast groundfish fisheries. Of those, about 500 vessels are registered to limited entry permits issued for either trawl, longline, or pot gear. About 1,500 vessels land groundfish against open access limits while either directly targeting groundfish or taking groundfish incidentally in fisheries directed at non-groundfish species. All but 10-20 of those vessels are considered small businesses by the Small Business Administration. There are also about 450 groundfish buyers on the West Coast, approximately 5 percent of which are responsible for about 80 percent of West Coast groundfish purchases. NMFS does not have data on the number of persons employed by these groundfish buyers, but it is safe to assume that at least some of the groundfish buyers are small businesses. In the 2001 recreational fisheries, there were 77 Washington charter vessels engaged in salt water fishing outside of Puget Sound, 232 charter vessels active on the Oregon coast and 415 charter vessels active on the California coast. While most of the West Coast charter businesses, particularly those in Washington and Oregon, are likely small businesses, there may be some West Coast charter businesses with annual receipts in excess of $5.0 million. This proposed rule is administrative in nature, thus none of these businesses will be subject to regulatory requirements resulting from this rule. However, fishing businesses will be affected by revisions to the Council's specifications and management measures process in that the process proposed by this rule would provide participants with more time and opportunity to review the specifications and management measures as they are developed in the Council and once they are proposed by the Federal government.

Small organizations. The RFA defines "small organizations" as any nonprofit enterprise that is independently owned and operated and is not dominant in its field.

Both small and large nonprofit enterprises participate in the Council process. Several of the environmental nonprofit organizations that participate in the Council process are dominant in their fields. However, there are also smaller, more localized environmental nonprofit organizations and fishermen's organizations that could be considered small organizations. While none of these organizations will be subject to regulatory requirements resulting from this rule, they will be affected by revisions to the Council's specifications and management measures process in that the process proposed by this rule would provide participants with more time and opportunity to review the specifications and management measures as they are developed in the Council and once they are proposed by the Federal government.

Small governmental jurisdictions. The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of less than 50,000.

Although many fishing communities are small governmental jurisdictions, no regulatory requirements for those governmental jurisdictions will result from this rule.

4) A description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record.

There are no projected reporting, recordkeeping or other compliance requirements associated with this proposed rule.

5) An identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

No duplicative requirements that have been identified.

6) A description of any alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimizes the significant economic impacts of the proposed rule on small entities.

The defined objectives of this proposed rule are to:

- Comply with a court order to provide more opportunity for public comment in the NMFS rule publication process;

- Streamline the process of and reduce the workload associated with developing specifications and management measures so that more Council and NMFS time may be devoted to issues other than specifications and management measures development.

The objectives of the proposed rule, applicable statutes, and the court order in Natural Resources Defense Council, Inc. v. Evans, 2001 168 F.Supp. 2d 1149 (N.D. Cal. 2001) could have been met by Issue 1 (Process) Alternatives 2-5, Alternative 3 preferred, and by all three OY Duration alternatives. Of the Process Alternatives, the proposed rule would implement the alternative expected to have the lowest economic effect on small entities. Process Alternatives 2, 4, and 5 would have resulted in a new fishery season start date, whereas Alternative 3 retains the January 1 season start date. To the extent that any effects were anticipated from the Issue 1 action, the effects were primarily expected to result from the change in fishing season start date, see Section 4.3 above. Of the OY Duration (Issue 2) Alternatives, the preferred Alternative 1 was expected to have the lowest economic effect on small entities. OY Duration Alternatives 2 and 3 could have resulted in greater fluctuations in inseason management measures, creating greater business uncertainty for fishery participants. To the extent that any effects were anticipated from the Issue 2 action, the effects were primarily expected to result from the Alternative 2 or 3 revision to the status quo use of one-year duration OYs, see Section 4.3 above.

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7.2 List of Public Meetings, Agencies and Persons Consulted

Meetings of the Groundfish Multi-Year Management Committee were held on December 13-14, 2001, and on January 31- February 2, 2002. Amendment 17 was further discussed at the Council's meetings in April, June, and September 2002. Through these meetings, the Council has consulted with the NMFS, WDFW, ODFW, CDFG, and the Groundfish Treaty Tribes. Through its Multi-Year Management Committee and advisory bodies, the Council has also consulted with representatives of the fishing and processing industries, environmental conservation organizations, academia and other public groups.

7.3 List of Federal Register Notices Published in Connection with this Action

66 FR 52114-52115 – 10/12/01 – Announcing November 2001 Council meeting where Council requested formation of Groundfish Multi-Year Management Committee based on recommendations of Groundfish Management Process Committee

66 FR 59575 – 11/29/01 – Announcing first Groundfish Multi-Year Management Committee meeting for December 13-14, 2001

> SUPPLEMENTARY INFORMATION: The formation of this ad hoc committee is in response to the Council's request for a committee to scope multi-year management approaches for the West Coast groundfish fishery. Multi-year management of the groundfish fishery would be synchronized with a multi-year groundfish stock assessment schedule. Full accommodation of federal notice and comment requirements would also be incorporated into the multi-year cycle. This is the first meeting of the committee, and the primary purpose of the meeting is to refine the purpose and objectives of multi-year management, as well as initiate scoping of alternative approaches.

67 FR 569 – 01/04/02 – Announcing second Groundfish Multi-Year Management Committee meeting for January 31-February 2, 2002

67 FR 7358-7360 – 02/19/02 – Announcing March 2002 Council meeting where initial review of Groundfish Multi-Year Management Committee recommendations occurred.

67 FR 13317-13318 – 03/22/02 – Announcing April 2002 Council meeting where Council initiated FMP amendment.

7.4 List of Preparers

This document was prepared by the Northwest Regional Office of the National Marine Fisheries Service. *Yvonne deReynier*, NMFS, Northwest Region, project leader and primary author. *William Daspit*, Pacific States Marine Fisheries Commission, PacFIN database catch and revenue data extraction. *Jamie Goen*, NMFS Northwest Region, open access fisheries descriptions. *Richard Methot*, NMFS, Northwest Fisheries Science Center, discussion of effects of changing the management process on the timeliness of stock assessment information. *Carrie Nordeen*, NMFS, Northwest Region, non-groundfish and protected species descriptions. *Becky Renko*, NMFS, Northwest Region, discussion of groundfish stock assessment process and groundfish species descriptions. *Edward Waters*, Pacific Fishery Management Council, analysis of the expected economic effects of altering the start date of the fishing year. Preparers also appreciate the organizational aid of *Daniel Waldeck* of the Pacific Fishery Management Council, who staffed Groundfish Multi-Year Management Committee meetings and Amendment 17 discussion items for the Council.

Appendix A

AMENDATORY LANGUAGE FOR AMENDMENT 17 – MULTI-YEAR MANAGEMENT

This document presents draft amendatory language that would revise the FMP to allow multi-year management. Plain text shows status quo language. Bolded text shows where the FMP would be amended to allow a biennial specifications and management measures process under the preferred alternatives for each issue (Process Alternative 3 and OY Duration Alternative 1). Some ~~strikeout~~ text is shown as editing text that is not relevant to any of the alternatives. There are numerous places in the FMP where the words "annual," "year," or "yearly" are used in descriptive paragraphs mentioning the Council's annual specifications and management measures process without affecting that process. To better focus attention on the FMP processes that would be affected by Amendment 17, these descriptive paragraphs have not been provided here. The Council has given its staff permission to make minor edits to account for the change in process from a one-year management period to a two-year management period.

2.2 Operational Definition of Terms

Acceptable Biological Catch (ABC) is a biologically based estimate of the amount of fish that may be harvested from the fishery each year without jeopardizing the resource. It is a seasonally determined catch that may differ from MSY for biological reasons. It may be lower or higher than MSY in some years for species with fluctuating recruitment. The ABC may be modified to incorporate biological safety factors and risk assessment due to uncertainty. Lacking other biological justification, the ABC is defined as the MSY exploitation rate multiplied by the exploitable biomass for the relevant time period.

* * *

Biennial fishing period is defined as a 24-month period beginning January 1 and ending December 31.

* * *

5.0 SPECIFICATION AND APPORTIONMENT OF HARVEST LEVELS

The ability to establish and adjust harvest levels is the first major tool at the Council's disposal to exercise its resource stewardship responsibilities. Each ~~fishing year~~ **biennial fishing period**, the Council will assess the biological, social, and economic condition of the Pacific coast groundfish fishery and update maximum sustainable yield (MSY) estimates or proxies for specific stocks (management units) where new information on the population dynamics is available. The Council will make this information available to the public in the form of the *Stock Assessment and Fishery Evaluation (SAFE)* document described in Section 5.1. Based upon the best scientific information available, the Council will evaluate the current level of fishing relative to the MSY level for stocks where sufficient data are available. Estimates of the acceptable biological catch (ABC) for major stocks will be developed, and the Council will identify those species or species groups which it proposes to be managed by the establishment of numerical harvest levels (optimum yields [OYs], harvest guidelines [HGs], or quotas). For those stocks judged to be below their overfished/rebuilding threshold, the Council will develop a stock rebuilding management strategy.

The process for specification of numerical harvest levels includes the estimation of ABC, the establishment of OYs for various stocks, calculation of specified allocations between harvest sectors, and the apportionment of numerical specifications to domestic annual processing (DAP), joint venture processing (JVP), total allowable level of foreign fishing (TALFF), and the reserve. The specification of numerical harvest levels described in this chapter is the process of designating and adjusting overall

numerical limits for a stock either throughout the entire fishery management area or throughout specified subareas. The process normally occurs ~~annually~~ **biennially** between ~~September and November~~ **November and June**, but can occur, under specified circumstances at other times of the fishing year. The Council will identify those OYs which should be designated for allocation between limited entry and open access sectors of the commercial industry. Other numerical limits which allocate the resource or which apply to one segment of the fishery and not another are imposed through the socioeconomic framework process described in Chapter 6 rather than the specification process.

The National Marine Fisheries Service (NMFS) Regional Administrator will review the Council's recommendations, supporting rationale, public comments, and other relevant information; and, if it is approved, will undertake the appropriate method of implementation. Rejection of a recommendation will be explained in writing.

The procedures specified in this chapter do not affect the authority of the U.S. Secretary of Commerce (Secretary) to take emergency regulatory action as provided for in Section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) if an emergency exists involving any groundfish resource or to take such other regulatory action as may be necessary to discharge the Secretary's responsibilities under Section 305(d) of the Magnuson-Stevens Act.

The ~~annual~~ specification**s and management measures** process, in general terms, occurs as follows:

1. The Council will determine the MSY or MSY proxy and ABC for each major stock. Typically, the MSY proxy will be in terms of a fishing mortality rate ($F_{x\%}$,) and ABC will be the $F_{x\%}$ applied to the current biomass estimate.

2. Every species will either have its own designated OY or be included in a multispecies OY. Species which are included in a multispecies OY may also have individual OYs, have individual HGs, or be included in a HG for a subgroup of the multispecies OY. Stocks without quantitative or qualitative assessment information may be included in a numerical or non-numerical OY.

3. To determine the OY for each stock, the Council will determine the best estimate of current abundance and its relation to its precautionary and overfished thresholds. If the abundance is above the precautionary threshold, OY will be equal to or less than ABC. If abundance falls below the precautionary threshold, OY will be reduced according to the harvest control rule for that stock. If abundance falls below the overfished/rebuilding threshold, OY will be set according to the interim rebuilding rule until the Council develops a formal rebuilding plan for that species.

4. ****Editorial changes for this paragraph would be addressed under Amendment 16 (overfished species rebuilding) to the FMP**** For any stock the Secretary has declared overfished or approaching the overfished condition, or for any stock the Council determines is in need of rebuilding, the Council will develop a rebuilding plan and submit it in the same manner as recommendations of the annual management process. Once approved, a rebuilding plan will remain in effect for the specified duration or until the Council recommends and the Secretary approves revision.

5. The Council may reserve and deduct a portion of the ABC of any stock to provide for compensation for vessels conducting scientific research authorized by NMFS. Prior to the research activities, the Council will authorize amounts to be made available to a research reserve. However, the deduction from the ABC will be made in the year after the "compensation fishing"; the amounts deducted from the ABC will reflect the actual catch during compensation fishing activities.

6. The Council will identify stocks which are likely to be fully harvested (i.e., the ABC, OY, or HG achieved) in the absence of specific management measures and for which allocation between limited entry and open access sectors of the fishery is appropriate.

7. The groundfish resource is fully utilized by U.S. fishing vessels and seafood processors. The Council

may entertain applications for foreign or joint venture fishing or processing at any time, but fishing opportunities may be established only through amendment to this FMP. This section supercedes other provisions of this FMP relating to foreign and joint venture fishing.

This chapter describes the steps in this process.

5.1 SAFE Document

****Annual SAFE documents are required under NOAA guidelines implementing National Standard 2 of the Magnuson-Stevens Act (base conservation and management measures on the best available scientific information.) Under Amendment 16 to the FMP, the Council will consider revising the SAFE document production schedule (stock assessments available before final decision on specifications and management measures, evaluation of the fishery available after end of fishing year).**

Amendment 17 adopts a biennial management process. Under a biennial management process, some elements of the SAFE document may not be necessary in years when the Council is not preparing specifications and management measures. For example, elements 2, 5, 6, 7, and 11 could be eliminated from "off year" SAFE documents without violating the National Standards guidelines or hampering the Council's ability to conduct inseason management.**

For the purpose of providing the best available scientific information to the Council for evaluating the status of the fisheries relative to the MSY and overfishing definition, developing ABCs, determining the need for individual species or species group management, setting and adjusting numerical harvest levels, assessing social and economic conditions in the fishery, and updating the appendices of this fishery management plan (FMP); a SAFE document is prepared annually. Not all species and species groups can be reevaluated every year due to limited state and federal resources. However, the SAFE document will in general contain the following information:

1. A report on the current status of Washington, Oregon, and California groundfish resources by major species or species group.

2. Specify and update estimates of harvest control rule parameters for those species or species groups for which information is available.

3. Estimates of MSY and ABC for major species or species groups.

4. Catch statistics (landings and value) for commercial, recreational, and charter sectors.

5. Recommendations of species or species groups for individual management by OYs.

6. A brief history of the harvesting sector of the fishery, including recreational sectors.

7. A brief history of regional groundfish management.

8. A summary of the most recent economic information available, including number of vessels and economic characteristics by gear type.

9. Other relevant biological, social, economic, ecological, and essential fish habitat information which may be useful to the Council.

10. A description of any rebuilding plans currently in effect, a summary of the information relevant to the rebuilding plans, and any management measures proposed or currently in effect to achieve the rebuilding plan goals and objectives.

11. A list of annual specifications and management measures that have been designated as routine under processes described in the FMP at Section 6.2.

Under a biennial specifications and management measures process, elements 2, 5, 6, 7, and 11 would not need to be included in a SAFE document in years when the Council is not setting specifications and management measures for an upcoming biennial fishing period. The preliminary SAFE document is normally completed late in the year, generally late October, when the most current stock assessment and fisheries performance information is available and prior to the meeting at which the Council approves its final management recommendations for the upcoming year. The Council will make the preliminary SAFE document available to the public by such means as mailing lists or newsletters and will provide copies upon request. A final SAFE may be prepared after the Council has made its final recommendations for the upcoming year and will include the final recommendations, including summaries of proposed and pre-existing rebuilding plans. The final SAFE document, if prepared, will also be made available upon request.

* * *

5.4 Authorization and Accounting for Fish Taken as Compensation for Authorized Scientific Research Activities.

At a Council meeting, NMFS will advise the Council of upcoming resource surveys that would be conducted using private vessels with groundfish as whole or partial compensation. For each proposal, NMFS will identify the maximum number of vessels expected or needed to conduct the survey, an estimate of the species and amounts of compensation fish likely to be needed to compensate vessels for conducting the survey, when the fish would be taken, and when the fish would be deducted from the ABC in determining the OY/harvest guideline. NMFS will initiate a competitive solicitation to select vessels to conduct resource surveys. NMFS will consult with the Council regarding the amounts and types of groundfish species to be used to support the surveys. If the Council approves NMFS' proposal, NMFS may proceed with awarding the contracts, taking into account any modifications requested by the Council. If the Council does not approve the proposal to use fish as compensation to pay for resource surveys, NMFS will not use fish as compensation.

Because the species and amounts of fish used as compensation will not be determined until the contract is awarded, it may not be possible to deduct the amount of compensation fish from the ABC or harvest guideline in the year that the fish are caught. Therefore, the compensation fish will be deducted from the ABC the **year or biennial fishing period** after the fish are harvested. During the ~~annual~~ specifications **and management measures** process, NMFS will announce the total amount of fish caught during the year **or biennial fishing period** as compensation for conducting a resource survey, which then will be deducted from the following year's ABCs in setting the OYs.

* * *

5.6 ~~Annual~~ **Biennial** Implementation Procedures for Specifications and ~~Apportionments~~ (previously section 5.8)

~~Annually~~ **Biennially**, the Council will develop recommendations for the specification of ABCs, OYs, any HGs or quotas, ~~and apportionments to DAH, DAP, JVP, and TALFF and the reserve~~ over the span of ~~two~~ **three** Council meetings. In addition during this process, the Council may recommend establishment of HGs and quotas for species or species groups within an OY. **Depending on stock assessment availability and fishery management interactions with Canada, the Council may also develop recommendations for the specification of the Pacific whiting ABC/OY and quotas in a separate, annual process.**

The Council will develop preliminary recommendations at the first of ~~two~~ **three** meetings (usually in ~~August or September~~ **in November)** , based upon the best stock assessment information available to the Council at the time and consideration of public comment. After the first meeting, the Council will provide a summary of its preliminary recommendations and their basis to the public through its mailing list as well as providing copies of the information at the Council office and to the public upon request. The Council will notify the public of its intent to develop final recommendations at its ~~second~~ **third** meeting (usually ~~October or November~~ **in June)**, and solicit public comment both before and at its second meeting.

At its second **and/or third** meeting, the Council will again consider the best available stock assessment information which should be contained in the recently completed SAFE report and consider public testimony before adopting final recommendations to the Secretary. Following the ~~second~~ **third** meeting, the Council will submit its recommendations along with the rationale and supporting information to the Secretary for review and implementation.

Upon receipt of the Council's recommendations supporting rationale and information, the Secretary will review the submission, and, if it is sufficient for public review, ~~publish a notice in the *Federal Register* making the Council's recommendations effective January 1 of the upcoming fishing year~~ **publish a proposed rule in the *Federal Register*, making the Council's recommendations available for public comment and agency review. Following the public comment period on the proposed rule, the Secretary will review the proposed rule, taking into account any comments or additional information received, and will publish a final rule in the *Federal Register*, possibly modified from the proposed rule in accordance with the Secretary's consideration of the proposed rule.**

In the event that the Secretary disapproves one or more of the Council's recommendations, he may implement those portions approved and notify the Council in writing of the disapproved portions along with the reasons for disapproval. The Council may either provide additional rationale or information to support its original recommendation, if required, or may submit alternative recommendations with supporting rationale. In the absence of an approved recommendation at the beginning of the ~~fishing year~~ **biennial fishing period**, the current specifications in effect at the end of the previous ~~fishing year~~ **biennial fishing period** will remain in effect until modified, superseded, or rescinded.

5.7 Inseason Procedures for Establishing or Adjusting Specifications and ~~Apportionments~~ (previously 5.9)

5.7.1 Inseason Adjustments to ABCs, OYs, HGs, and Quotas

Under the biennial specifications and management measures process, stock assessments for most species will become available every other year, prior to the November Council meeting that begins the three-meeting process for setting specifications and management measures. The November Council meeting that begins that three-meeting process will be the November of the first fishing year in a biennial fishing period. If the Council determines that any of the ABCs or OYs set in the prior management process are not adequately conservative to meet rebuilding plan goals for an overfished species, harvest specifications for that overfished species and/or for co-occurring species may be revised for the second fishing year of the then current biennial management period. ~~Occasionally, new stock assessment information may become available inseason that supports a determination that an ABC no longer accurately describes the status of a particular species or species group. However, adjustments will only be made during the annual specifications process and a revised ABC announced at the beginning of the next fishing year.~~

~~The only exception is in the case where the ABC announced at the beginning of the fishing year~~ **Beyond this process, ABCs, OYs, HGs, and quotas may only be modified in cases where a harvest specification announced at the beginning of the fishing period** is found to have resulted from incorrect data or from computational errors. If the Council finds that such an error has occurred, it may recommend the Secretary publish a notice in the *Federal Register* revising the ~~ABC~~ **incorrect harvest**

specification at the earliest possible date.

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* * *5.7.2 would be eliminated and 5.7.3 would be renumbered as 5.7.2* * *

6.0 MANAGEMENT MEASURES

* * *

6.2 General Procedures for Establishing and Adjusting Management Measures

Management measures are normally imposed, adjusted, or removed at the beginning of the ~~fishing year~~ **biennial fishing period**, but may, if the Council determines it necessary, be imposed, adjusted, or removed at any time during the ~~year~~ **period**. Management measures may be imposed for resource conservation, social or economic reasons consistent with the criteria, procedures, goals, and objectives set forth in the FMP.

Because the potential actions which may be taken under the two frameworks established by the FMP cover a wide range analyses of biological, social, and economic impacts will be considered at the time a particular change is proposed. As a result, the time required to take action under either framework will vary depending on the nature of the action, its impacts on the fishing industry, resource, environment, and review of these impacts by interested parties. Satisfaction of the legal requirements of other applicable law (e.g., the Administrative Procedure Act, Regulatory Flexibility Act, **relevant** Executive **Orders** ~~12291~~, etc.) for actions taken under this framework requires analysis and public comment before measures may be implemented by the Secretary.

Four different categories of management actions are authorized by this FMP, each of which requires a slightly different process. Management measures may be established, adjusted, or removed using any of the four procedures. The four basic categories of management actions are as follows:

A. Automatic Actions - Automatic management actions may be initiated by the NMFS Regional Administrator without prior public notice, opportunity to comment, or a Council meeting. These actions are nondiscretionary, and the impacts previously must have been taken into account. Examples include fishery, season, or gear type closures when a quota has been projected to have been attained. The Secretary will publish a single "notice" in the *Federal Register* making the action effective.

B. "Notice" Actions Requiring at Least One Council Meeting and One *Federal Register* Notice - These include all management actions other than "automatic" actions that are either nondiscretionary or for which the scope of probable impacts has been previously analyzed.

These actions are intended to have temporary effect, and the expectation is that they will need frequent adjustment. They may be recommended at a single Council meeting ~~(usually November)~~, although the Council will provide as much advance information to the public as possible concerning the issues it will be considering at its decision meeting. The primary examples are those **inseason** management actions defined as "routine" according to the criteria in Section 6.2.1. These include trip landing and frequency limits and size limits for all commercial gear types and closed seasons for any groundfish species in cases where protection of an overfished or depleted stock is required, and bag limits, size limits, time/area closures, boat limits, hook limits, and dressing requirements for all recreational fisheries. Previous analysis must have been specific as to species and gear type before a management measure can be defined as "routine" and acted upon at a single Council meeting. If the recommendations are approved, the Secretary will waive for good cause the requirement for prior notice and comment in the *Federal Register* and will publish a single "notice" in the *Federal Register* making the action effective. This category of actions presumes the Secretary will find that **the need for swift implementation and** the extensive notice and opportunity for comment on these types of measures along with the scope of their impacts already provided by the Council will serve as good cause to waive the need for additional prior

notice and comment in the *Federal Register.*

C. ~~Abbreviated Rulemaking Actions Normally Requiring at Least Two Council Meetings and One *Federal Register* "Rule" or "Notice"~~ **C. Management Measures Rulemaking Actions Developed Through the Three Council Meeting Biennial Specifications Process and Two *Federal Register* Rules** - These include (1) management measures developed through the biennial specifications process, (2) management actions being classified as "routine", or (3) trip limits that vary by gear type, closed seasons or areas, and in the recreational fishery, bag limits, size limits, time/area closures, boat limits, hook limits, and dressing requirements the first time these measures are used or ~~(3) management measures that are intended to have permanent effect and are discretionary, and for which the impacts have not been previously analyzed~~ **(moved to Section D, below).** Examples include changes to or imposition of gear regulations, or imposition of landings limits, frequency limits, or limits that are differential by gear type, or closed areas or seasons for the first time on any species or species group, or gear type. The Council will develop and analyze the proposed management actions over the span of at least two Council meetings ~~(usually September and November)~~ **(usually April and June)** and provide the public advance notice and opportunity to comment on both the proposals and the analysis prior to and during the Council process at the second Council meeting. ~~If the Regional Administrator approves the Council's recommendation, the Secretary will waive for good cause the requirement for prior notice and comment in the *Federal Register* and publish a "final rule" or "notice" in the *Federal Register* which will remain in effect until amended.~~ If a management measure is designated as "routine" under this procedure, specific adjustments of that measure can subsequently be announced in the *Federal Register* by "notice" as described in the previous paragraphs. ~~Nothing in this section prevents the Secretary from exercising the right not to waive the opportunity for prior notice and comment in the *Federal Register*, if appropriate, but presumes the Council process will adequately satisfy that requirement.~~ **The Secretary will publish a "proposed rule" in the *Federal Register* with an appropriate period for public comment followed by publication of a "final rule" in the *Federal Register.***

It should be noted the ~~two~~ **three** Council meeting process refers to two decision meetings. The first meeting to develop proposed **harvest specifications** ~~management measures and their alternatives~~, the second meeting to **finish drafting harvest specifications and to develop the management measures and the third meeting to** make final **recommendations** to the Secretary **on the complete harvest specifications and management measures biennial management package.** For the Council to have adequate information to identify proposed management measures for public comment at the first meeting, the identification of issues and the development of proposals normally must begin at a prior Council meeting, ~~usually the June Council meeting~~.

D. Full Rulemaking Actions Normally Requiring at Least Two Council Meetings and Two *Federal Register* Rules (Regulatory Amendment) - These include any proposed management measure that is highly controversial or any measure which directly allocates the resource. **These also include management measures that are intended to have permanent effect and are discretionary, and for which the impacts have not been previously analyzed. (moved from Section C, above)** The Council normally will follow the two meeting procedure described for the ~~abbreviated~~ **specifications and management measures** rulemaking category. For the Council to have adequate information to identify proposed management measures for public comment at the first meeting, the identification of issues and the development of proposals normally must begin at a prior Council meeting. The Secretary will **normally** publish a "proposed rule" in the *Federal Register* with an appropriate period for public comment followed by publication of a "final rule" in the *Federal Register.*

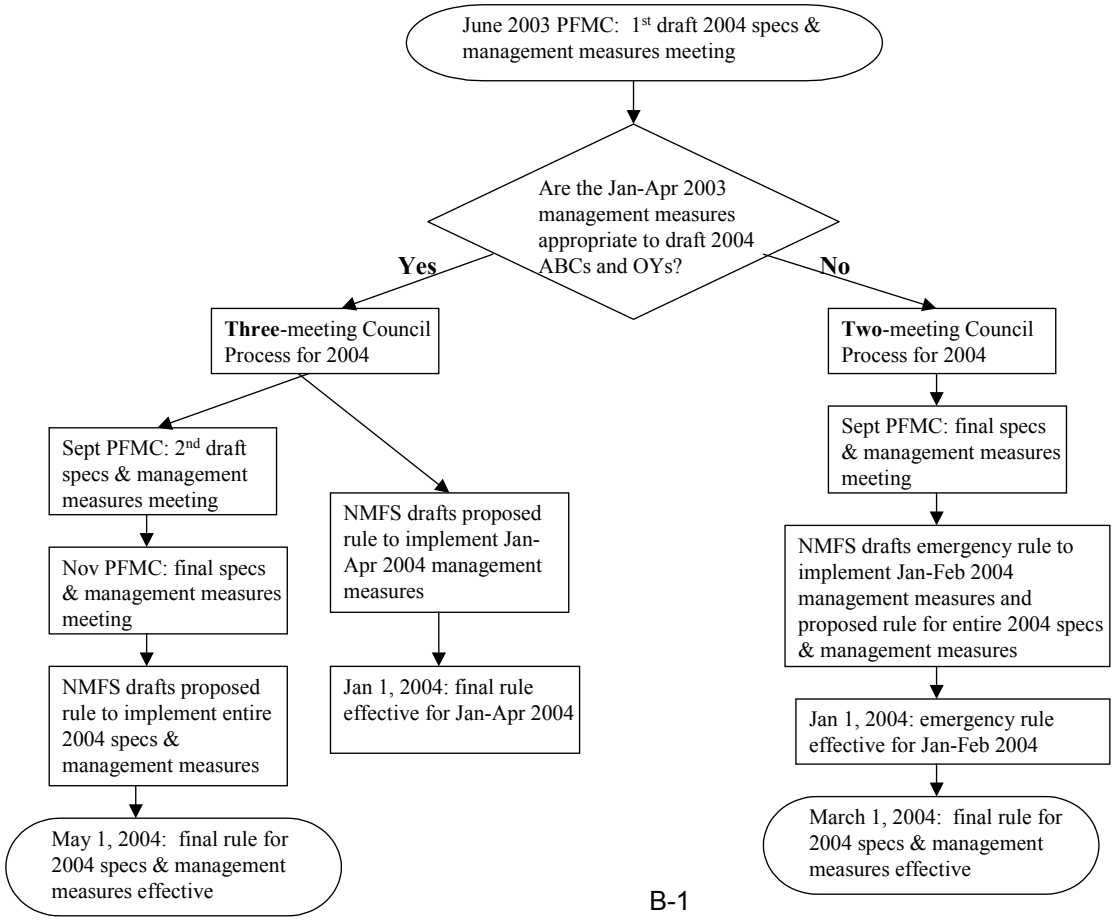
Management measures recommended to address a resource conservation issue must be based upon the establishment of a "point of concern" and consistent with the specific procedures and criteria listed in Section 6.2.2.

Management measures recommended to address social or economic issues must be consistent with the specific procedures and criteria described in Section 6.2.3.

Appendix B

TRANSITION TO MULTI-YEAR MANAGEMENT UNDER PROCESS ALTERNATIVE 3 (COUNCIL PREFERRED)

In order to transition from the current annual management process with two Council meetings for specifications and management measures development to a biennial process with three Council meetings, the Council will be integrating the development processes for the 2004 specifications and management measures and for the 2005-2006 specifications and management measures. The first Council meeting for developing the 2004 specifications and management measures will be in June 2003. At that meeting, the Council will determine whether the January-April 2003 management measures are adequate to meet the management and conservation goals for the draft 2004 ABCs/OYS for January-April 2004. The following flowchart shows how Council and NMFS processes would proceed under the two-meeting and three-meeting processes for 2004 specifications and management measures. Regardless of which process is used for 2004, the Council process for the 2005-2006 specifications and management measures would begin in November 2004.



TRANSITION TO BIENNIAL MANAGEMENT PROCESS UNDER ALTERNATIVE 3 (WITH *TWO*-MEETING '04 TRANSITION)

	Jan '03	April '03	June '03	Sept '03	Nov '03	Jan '04	Mar/Apr 04	June '04	Sept '04	Nov '04	Jan '05
Stock Assessments	Assessments and STAR for '04 due **5/03** Assessments and STAR for '05-'06 due **10/03**					"Off" year for stock assessments. Advanced model development and stock assessment model refinement year.					"On" year begins
Council Process			Proposed '04 Specs	Final '04 Specs	Proposed '05-'06 ABC/OY		Proposed '05-'06 manage measures	Final '05-'06 Specs & manage measures	First "off" year for Council begins 9/04 and ends 11/05. In 11/05, proposed ABC/OY for '07-'08		
NMFS Regulatory Process	Public review and NOAA implementation of Amendment 17			'04 Specs via emergency for Jan-Feb or carry-over if '03 conservative enough '04 Specs proposed rule, public review; final rule due 3/04				NMFS sends '05-'06 out for public review via proposed rule and implements via final rule by 01/05			

TRANSITION TO BIENNIAL MANAGEMENT PROCESS UNDER ALTERNATIVE 3 (WITH *THREE*-MEETING '04 TRANSITION)

	Jan '03	**April '03**	**June '03**	**Sept '03**	**Nov '03**	**Jan '04**	**Mar/Apr 04**	**June '04**	**Sept '04**	**Nov '04**	**Jan '05**
Stock Assessments	Assessments and STAR for '04 due **5/03** Assessments and STAR for '05-'06 due **10/03**					"Off" year for stock assessments. Advanced model development and stock assessment model refinement year.					"On" year begins
Council Process			Proposed '04 Specs	Proposed '04 manage measures	Final '04 Specs Proposed '05-'06 ABC/OY		Proposed '05-'06 manage measures	Final '05-'06Specs & manage measures	First "off" year for Council begins 9/04 and ends 11/05. In 11/05, proposed ABC/OY for '07-'08		
NMFS Regulatory Process	Public review and NOAA implementation of Amendment 17				'04 Specs via emergency for Jan-**Apr** or carry-over if '03 conservative enough '04 Specs proposed rule, public review; final rule due 3/04				NMFS sends '05-'06 out for public review via proposed rule and implements via final rule by 01/05		