DRAFT
PROCESS AND STANDARDS FOR REBUILDING PLANS
AND
REBUILDING PLANS FOR:

DARKBLOTCHED ROCKFISH (Attachment 3)
PACIFIC OCEAN PERCH (Attachment 4)
COWCOD (Attachment 5)
LINGCOD (Attachment 6)

AMENDMENT 16
TO THE PACIFIC COAST GROUNDFISH FISHERY MANAGEMENT PLAN

INCLUDING DRAFT ENVIRONMENTAL IMPACT STATEMENTS AND
REGULATORY ANALYSES

Prepared by the Pacific Fishery Management Council

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# TABLE OF CONTENTS

## ABBREVIATIONS AND ACRONYMS

v

## OVERVIEW

vii

## PART A

1.0 Introduction .................................................. 1-3
  1.1 How This Amendment is Organized .......................... 1-3
  1.2 Purpose and Need ........................................... 1-3
  1.2.1 Problems for Resolution ................................. 1-3
  1.2.2 Purpose of the Actions Proposed in this Volume ........ 1-4
  1.3 Background ................................................. 1-4
  1.3.1 Requirements for Rebuilding Plans ..................... 1-4
  1.3.2 Rebuilding Analyses ..................................... 1-5
  1.3.3 Summary of the Current Management Regime ............ 1-13
  1.3.2 Summary of Litigation over Amendment 12 ............. 1-13
  1.4 Scoping Summary ........................................... 1-13
  Relevant Issues ............................................... 1-17

2.0 PROCESS AND STANDARDS ALTERNATIVES ........................ 2-1
  2.1 Description of the Alternatives .......................... 2-1
  2.1.1 Issue 1- Form and Required Elements for the Species Rebuilding Plan 2-1
  2.1.2 Issue 2- Periodic Review and Rebuilding Plan Amendment ... 2-5
  2.1.5 Issue 5- Housekeeping Measures ........................ 2-9
  2.2 Council-recommended Alternatives ........................ 2-10

3.0 AFFECTED ENVIRONMENT ....................................... 3-1
  3.1 Biological Environment .................................... 3-1
  3.1.1 Overfished Groundfish Species or Stocks ................ 3-1
  3.1.2 Other Management Unit Species .......................... 3-3
  3.1.3 Incidentally Caught Species Outside the Management Unit 3-4
  3.1.3 Habitat Including Essential Fish Habitat (EFH) ........ 3-5
  3.1.4 Biodiversity and Ecosystem Function .................... 3-6
  3.1.5 Protected Species ....................................... 3-7
  3.2 Socioeconomic Environment ................................ 3-11
  3.2.1 FMP Fisheries Overall ................................... 3-11
  3.2.2 Commercial Sector ....................................... 3-12
  3.2.3 Recreational Sector ..................................... 3-12
  3.2.4 Buyers and Processors ................................... 3-12
  3.2.5 Communities ............................................ 3-13
  3.2.6 Health and Safety ....................................... 3-13

3.3 Current Management Regime .................................. 3-13

4.0 ENVIRONMENTAL CONSEQUENCES ................................ 4-1

5.0 CONSISTENCY WITH FMP OBJECTIVES AND THE MAGNUSON-STEVENS ACT 5-1
  5.1 FMP Goals and Objectives .................................. 5-1
  5.2 National Standards .......................................... 5-4
  5.3 Other Applicable Magnuson-Stevens Act Provisions ......... 5-5

6.0 OTHER APPLICABLE LAW ....................................... 6-1
  6.1 National Environmental Policy Act ........................ 6-1
  6.2 Regulatory Impact Review and Regulatory Flexibility Act Determination 6-1
PART B: Darkblotched Rockfish Rebuilding Plan

PART C: Pacific Ocean Perch Rebuilding Plan

PART D: Cowcod Rebuilding Plan

PART E: Lingcod Rebuilding Plan
# ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC</td>
<td>Allowable Biological Catch</td>
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<td>CEQ</td>
<td>Council on Environmental Quality</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<td>cm</td>
<td>centimeter</td>
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<td>CMC</td>
<td>Center for Marine Conservation</td>
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<td>CPS</td>
<td>Coastal Pelagic Species</td>
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<td>DTS</td>
<td>Dover sole-Thornyhead-Sablefish</td>
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<tr>
<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<td>EFH</td>
<td>Essential Fish Habitat</td>
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<td>EIS</td>
<td>Environmental Impact Statement</td>
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<td>Executive Order</td>
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<td>ESA</td>
<td>Endangered Species Act</td>
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<td>FMP</td>
<td>Fishery Management Plan</td>
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<td>U.S. Fish and Wildlife Service</td>
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<td>GMT</td>
<td>Groundfish Management Team</td>
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<td>IPHC</td>
<td>International Pacific Halibut Commission</td>
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<td>kg</td>
<td>kilogram</td>
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<td>m</td>
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<td>MBTA</td>
<td>Migratory Bird Treaty Act</td>
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<td>MMPA</td>
<td>Marine Mammal Protection Act</td>
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<td>Magnuson-Stevens Fishery Conservation and Management Act</td>
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<td>MSST</td>
<td>Minimum Stock Size Threshold</td>
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<td>MSY</td>
<td>Maximum Sustainable Yield</td>
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<td>mt</td>
<td>metric ton</td>
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<td>NEPA</td>
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<td>Natural Resources Defense Council</td>
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<td>OY</td>
<td>Optimum Yield</td>
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<td>RFA</td>
<td>Regulatory Flexibility Act (or Analysis)</td>
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<td>RIR</td>
<td>Regulatory Impact Review</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<td>SFA</td>
<td>Sustainable Fisheries Act</td>
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<td>SOPP</td>
<td>Statement of Organization, Practices, and Procedures</td>
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<td>SSC</td>
<td>Scientific and Statistical Committee</td>
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<td>STAR</td>
<td>Stock Assessment Review Panel</td>
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<td>STAT</td>
<td>Stock Assessment Team</td>
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<td>WOC</td>
<td>Washington-Oregon-California</td>
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OVERVIEW

Purpose of and Need for Amendment 16

To date nine species managed under the Pacific Fishery Management Council's Pacific Coast Groundfish Fishery Management Plan (Groundfish FMP) have been declared overfished by the Secretary of Commerce pursuant to provisions in Magnuson-Stevens Fishery Management and Conservation Act (MSA) and based on criteria in the Groundfish FMP. In response, the Council amended the Groundfish FMP to establish a framework process for adopting rebuilding plans and began developing rebuilding plans as species were declared overfished. Framework rebuilding plan measures were implemented through the annual specifications that control groundfish fishery harvests. However, in Natural Resources Defense Council, Inc. v. Evans, 2001 WL 1246622 (N.D. Cal. 2001) the Court found that the Council's rebuilding plans were not in compliance with the MSA because they were not in the form of an FMP or regulatory amendment. Because of these events the Council must establish a process for adopting rebuilding measures that conforms to MSA requirements. The Council also has to adopt the individual rebuilding plans and amend the FMP to incorporate rebuilding measures.

The overall purpose of this amendment package is to implement procedures to rebuild groundfish stocks declared overfished by the Secretary of Commerce. This purpose is addressed in two ways. First, this document establishes the contents of rebuilding plans and a process for implementing and periodically reviewing them (required by the MSA, §304(e)(7)). Second, rebuilding plans for a number of overfished stocks are incorporated into this document and adopted as plan amendments. Rebuilding plans for currently overfished species that are not covered by this amendment will be adopted in a subsequent plan amendment(s), pending the completion of new stock assessments and rebuilding analyses. Both the procedural provisions and the rebuilding plans themselves must meet the requirements of the MSA (and, in particular, National Standard 1 and §304(e), covering rebuilding plans) and should be consistent with FMP goals and objectives.

Organization of Amendment 16 Documentation

Drafting Amendment 16 poses a procedural challenge because it incorporates a number of components and the rebuilding plans are unlikely to be finished simultaneously. These components are separate actions with discrete consequences. However, the effects of all these actions in combination, or cumulatively, are likely to be complex and substantial. In order to overcome uncertainties about timing, ease adoption and consider the actions individually and cumulatively, this amendment document has a "modular" format. Taking this approach, each component is presented as an essentially stand-alone document; these are collected together under a uniting cover along with some generic elements, discussed below. The "modules" or document parts (procedural measures and individual rebuilding plans) have most of the elements required by the National Environmental Policy Act and other mandates, which require description and analysis of the effects of the proposed action in comparison to alternative methods to achieve the purpose of the action. These essential elements are: (1) a statement of purpose and need, (2) a description and comparison of alternatives, (3) a description of the affected environment, and (4) an analysis of the environmental consequences of each alternative if it were pursued. The modular format will allow individual rebuilding plans to be added to, or dropped from, the draft document during its preparation, depending on a range of contingencies that govern rebuilding plan completion (such as the availability of stock assessment and rebuilding analysis results). In combination the rebuilding plans are likely to have substantial cumulative effects and those plans not included in this document constitute "reasonably foreseeable actions." In order to address these effects, which may not be sufficiently analyzed in any one rebuilding plan or document module, a cumulative effects analysis appears separately in an appendix. This analysis may appear in future amendment documents, updated, that contain subsequent rebuilding plans. Some generic elements, such as a discussion of MSA National Standards and the specifics of mandates other than NEPA, may only appear in the "process and standards" module (Part A), and will be referenced in subsequent rebuilding plans.

This document is divided into several parts. Part A contains the "process and standards" alternatives and analysis of potential effects. The remaining Parts (A-I) are the rebuilding plans. Rebuilding plans incorporated in subsequent documents will also be identified by lettered parts.
PROCESS AND STANDARDS FOR REBUILDING PLANS

PART A

AMENDMENT 16 TO THE GROUNDFISH FISHERY MANAGEMENT PLAN

PACIFIC FISHERY MANAGEMENT COUNCIL
JUNE 2002
ABSTRACT

Nine species managed under the Pacific Fishery Management Council’s Pacific Coast Groundfish Fishery Management Plan (groundfish FMP) have been declared overfished by the Secretary of Commerce pursuant to provisions in Magnuson-Stevens Fishery Management and Conservation Act (MSA) and based on criteria in the groundfish FMP. In 2000 the Council developed rebuilding plans for the three species declared overfished at that time. Through an amendment it also established a framework within the groundfish FMP that specified a process for adopting rebuilding plans. While the Secretary, through NMFS, approved the FMP changes incorporating the framework process in late 2000, the Council was asked to revise the three initial rebuilding plans so that they conformed to the adopted framework in the FMP. These initial plans, which were subsequently revised by the Council and approved by NMFS, took the form of policy documents. They contained both specific objectives for reduced harvest mortality levels and other parameters and provisions required by the MSA and NOAA guidelines. (These “National Standard Guidelines” interpret MSA requirements.) The Council has implemented management actions to achieve fishing mortality levels specified in all interim and adopted rebuilding plans through regulations developed annually to control groundfish fishery harvests. (This annual specification process is described in the groundfish FMP and implemented through associated regulations.) However, in Natural Resources Defense Council, Inc. v. Evans, 2001 WL 1246622 (N.D. Cal. 2001) the Court found that the Council’s rebuilding plans were not in compliance with the MSA because they were not in the form of an FMP or regulatory amendment. Therefore, the purpose of Part A of this FMP amendment is to specify the process and standards by which the Council will develop and adopt rebuilding plans that comply with the finding of the Court. Based on scoping, this document will consider alternatives based on a number of major issues, including: (1) whether rebuilding plans should be established as plan amendments or regulatory amendments; (2) the broad elements of rebuilding plans to be incorporated into the FMP or adopted by regulation; (4) the specific parameters that will be so incorporated, how they will be specified (e.g. numerically, by algorithm) and whether they can be changed without a plan amendment, as new information becomes available; and (3) what schedule will be followed to review and evaluate progress made in rebuilding overfished stocks. The actual rebuilding plans are separate but related actions implemented in compliance with the process and standards described in this Part. This document is organized to address the requirements of the MSA, National Environmental Policy Act, Executive Order 12866, and the Regulatory Flexibility Act. In so doing it describes a range of “process and standards” alternatives and analyzes the environmental and socioeconomic impacts of these alternatives.
1.0 Introduction

1.1 How This Amendment is Organized

This document provides background information about and analysis of changes to the Pacific Coast Groundfish Fishery Management Plan incorporated as Amendment 16. The actual changes, or amended parts of the plan, appear in appendices. Fishery management plans (FMPs), and any amendments to them, must conform to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, or MSA), the principal legislation governing fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 miles from shore. In addition to addressing MSA mandates, this amendment document is organized so that it contains the analyses required under the National Environmental Policy Act (NEPA), the Regulatory Flexibility Act (RFA), and Executive Order 12866 (Regulatory Impact Review or RIR).

Draft Amendment 16 is divided into a number of stand-alone Parts, including this document analyzing the processes and standards for adopting rebuilding plans for overfished fish stocks. Each Part is to a large degree an independent document with the essential elements and analyses required by NEPA and the other mandates listed above. (This includes a purpose and need statement, suite of alternatives, description of the affected environment, and socioeconomic impact analysis.) Some generic elements, such as a discussion of MSA national standards and the specifics of mandates other than NEPA, may only appear in this “process and standards” sub-document, and will be referenced in subsequent rebuilding plans. As of this writing, nine groundfish species have been declared overfished and the cumulative effects of foreseeable rebuilding plans bear scrutiny. This analysis appears as an appendix that may be referenced by or incorporated into the several Parts of this amendment. This somewhat unorthodox, “modular” approach is necessitated because individual plans have different expected completion dates. It would be unwise either to wait for all plans to be completed to prepare this analysis—which would entail some delay—or analyze each part in wholly separate documents without an appreciation of their relationship.

The rest of this section discusses the reasons for changing the FMP. This description of purpose and need defines the scope of the subsequent analysis. Section 2 outlines different alternatives that have been considered to address the purpose and need. One of these alternatives will be chosen by the Pacific Fishery Management Council (hereafter, the Council) as a plan amendment to be recommended to NMFS. Section 3 describes the affected environment. This information provides the basis for the analysis contained in Section 4, which assesses the potential environmental and socioeconomic impacts of the alternatives outlined in Section 2. Section 5 details how this amendment meets 10 National Standards set forth in the MSA (§301(a)) and Groundfish FMP goals and objectives. Section 6, provides information on those other law, in addition to the MSA, that an amendment must be consistent with and how this amendment has satisfied those mandates.

1.2 Purpose and Need

1.2.1 Problems for Resolution

As of February 2002 the Secretary of Commerce had declared nine groundfish stocks overfished. These are: bocaccio (Sebastes paucispinis), canary rockfish (S. pinniger), cowcod (S. levis), darkblotched rockfish (S. crameri), lingcod (Ophiodon elongatus), pacific ocean perch (S. alutus), widow rockfish (S. entomelas), yelloweye rockfish (S. ruberrimus) and Pacific whiting (Merluccius productus). These declarations, stemming from MSA requirements, are based on overfishing criteria adopted by the Council under Amendment 11 to the Pacific Coast Groundfish FMP. The MSA (§304(e)(3)) also requires councils to “prepare a fishery management plan, plan amendment, or proposed regulations” in order to prevent overfishing and implement a plan to rebuild the overfished stocks. The Pacific Council developed Amendment 12 to specify an effective process for implementing rebuilding plans. This amendment was approved by the Council in April 2000 and approved by NMFS on December 7, 2000. However, in Federal Court the Natural Resources Defense Council, an environmental organization, challenged the
legality of the provisions in Amendment 12 related to rebuilding plans, based on the MSA and the National Environmental Policy Act (NEPA). The judge found that the rebuilding plans created in accordance with Amendment 12 did not comply with the MSA because the plans did not take the form of an FMP amendment or regulation. Therefore, the Council must specify rebuilding plans as an FMP or regulatory amendment.

Rebuilding plans are mandated when the size of a stock or stock complex falls below a level described in the FMP (the Minimum Stock Size Threshold or MSST). Diminished stock size may be caused or exacerbated by fishing. Regardless of the cause of the decline, fishing mortality needs to be controlled to prevent further deterioration in the condition of the stock, and if the stock has been overfished, to allow it to rebuild.\(^2\) Amendment 11 to the groundfish FMP established the “status determination criteria” (including MSST) that are used to determine whether overfishing is occurring and whether a stock has reached an overfished state. Rebuilding plans a specify how an overfished stock will be rebuilt.

Whether or not action is taken to reduce fishing mortality and rebuild the stocks, there are impacts on the natural environment, commercial and recreational fishing communities and those members of the public who benefit from a healthy fish stock. Additionally, when fishing mortality is reduced to rebuild, restrictions may need to be imposed on the harvest of co-occurring target species that would otherwise be sustainably harvested at their specified optimal yield.

1.2.2 Purpose of the Actions Proposed in this Part

The overall purpose of this Part of the amendment is to set the process and standards under which the Council will specify rebuilding plans for groundfish stocks declared overfished by the Secretary of Commerce. Both the procedural provisions and the standards established for rebuilding plans must meet the requirements of the MSA (and, in particular, National Standard 1 and §304(e), covering overfishing) and should be consistent with FMP goals and objectives.

1.3 Background

1.3.1 Requirements for Rebuilding Plans

National standard guidelines specify how rebuilding should occur and, in particular, establish constraints on council action (50 CFR600.310(e)). Rebuilding should bring stocks back to a population size that can support MSY (B\(_{\text{MSY}}\)). A rebuilding plan must specify a target year (T\(_{\text{TARGET}}\)) based on the time required for the stock to reach B\(_{\text{MSY}}\). This target is bounded by a lower limit (T\(_{\text{MIN}}\)) defined as the time needed for rebuilding in the absence of fishing (i.e., F = 0). Rebuilding plans for stocks with a T\(_{\text{MIN}}\) less than 10 years must have a target less than 10 years. If, as is the case with most of the groundfish stocks considered in this amendment, the biology of a particular species dictates a T\(_{\text{MIN}}\) of 10 years or greater, then the maximum allowable rebuilding time, T\(_{\text{MAX}}\), is the rebuilding time in the absence of fishing (T\(_{\text{MIN}}\)) plus “one mean generation time.” Mean generation time is a measure of the time required for a female to produce a reproductively-active female offspring (Restrepo et. al, 1998; also see Pielou 1977). Managers should strive to rebuild stocks in the shortest feasible time. However, the target year may be greater than the minimum rebuilding time (T\(_{\text{MIN}}\)) in order to mitigate impacts to fishing communities.

Because of the uncertainty surrounding stock assessments and future population trends (due, for example, to variable recruitment), these limits and the target need to be expressed probabilistically. At the outset of the rebuilding period T\(_{\text{TARGET}}\) should be set so that there is at least a 50% probability of

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\(^2\) The amendment also removed FMP provisions that allowed foreign fishing on groundfish stocks. This part of the amendment was not challenged and these changes to the FMP stand.

\(^\text{2}\) But when environmental changes affect the long-term productive capacity of the stock, one or more components of the status determination criteria may be respecified and the need for a reduction in fishing mortality reevaluated (50 CFR Section 600.310).
achieving it within the specified time period. The nature of probabilities associated with $T_{MN}$, $T_{TARGET}$ and $T_{MAX}$ are discussed further in the next section.)

National standard guidelines identify a “mixed-stock complex” exception to the definition of overfishing (50 CFR 660.310(d)(6)), which is applicable to some overfished groundfish species. Different fish assemblages—some with healthy stocks and some with overfished stocks—can co-occur in a mixed-stock complex, and thus both can be caught simultaneously. An optimum yield (OY) harvest for the healthy stock can result in overfishing the depleted stock. The guidelines allow councils to authorize this type of overfishing if three conditions are met. First, an FMP (or plan amendment) must assess the overall benefits of such a policy in comparison to other measures, such as reducing the OY for the healthy stock (50 CFR 660.315(f)(6)). Second, councils must consider mitigating measures that reduce overfishing by, for example, modifying fishing strategy or gear configuration. The benefits of mitigation must be compared to those determined in the preceding assessment; the measures would only be implemented if they will result in greater benefits. Finally, permitted overfishing cannot result in eventual listing of the species (or evolutionarily significant unit thereof) under the Endangered Species Act. This mixed-stock exception may be considered in formulating rebuilding plans and could allow some modification in the recovery trajectory of overfished stocks.

### 1.3.2 Rebuilding Analyses

Each rebuilding plan is based on an analysis that specifies the parameters contained in the rebuilding plan. The elements of rebuilding analyses are described in the SSC Terms of Reference for Rebuilding Analyses (SSC 2002). This guidance has been incorporated into a computer program developed by Dr. Andre Punt of the University of Washington School of Fisheries and Aquatic Sciences (Punt 2002b). In the analysis the probability that the overfished stock will reach its target biomass is determined with respect to $T_{MIN}$, $T_{MAX}$ and $T_{TARGET}$. Probability statements are an estimate that something may happen (in this case, that stocks will reach a given size in a specified time period) and thus also the level of risk associated with a given action. When interpreting rebuilding analyses it is important to understand how probability statements are derived, distinguish the basic policy choice from parameters that are essentially biological characteristics of the overfished stock, identify different sources of uncertainty, and appreciate that even “fixed” values can change as the system (or fish stock)—and our understanding of it—changes over time.

The rebuilding analysis program uses “Monte Carlo simulation” to derive a probability estimate for a given rebuilding strategy. This method projects population growth many times in separate simulations. It accounts for possible variability by randomly choosing the value of a key variable—in this case total recruitment or recruits per spawner—from a range of values. These values can be specified empirically, by listing some set of historical values, or by a relationship based on a model. The SSC recommends that the rebuilding analyses use historical values. Because of this variability in a key input value, each simulation will show a different pattern of population growth. As a result, a modeled population may reach the target biomass that defines a rebuilt stock ($B_{reb}$) in a different year in each of the simulations. Figures 1-1a and 1-1b show the results of five such simulations each for widow rockfish and bocaccio at a specified level of fishing mortality. The horizontal line represents target biomass. In Figure 1-1a, showing widow rockfish, the simulations reach this level in years ranging from 2035 to 2057. Bocaccio population growth simulations, shown in Figure 1-1b, are much more variable, reflecting variation in the historical recruitment data. Two of the simulations reach the target but subsequently fluctuates above and below this level; two others do not reach the target in the time period displayed; a third shows rapid growth to a level above the target near the end of the displayed time period. The number of simulations that reach the target biomass in any year before a specified year can be compared to the total number of

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3 The use of a low bound 50% probability is not specified in regulations; it is the result of litigation (Natural Resources Defense Council v. Daley, April 25, 2000, U.S. Court of Appeals for the District of Columbia Circuit).

4 Although these figures plot the results of the rebuilding analysis computer program, they are used here to illustrate concepts underlying the analyses. It cannot be assumed that these plots correspond to the actual rebuilding analysis results because more recent stock assessment data may be used in the published analyses.
simulations in the “program run.” This gives an estimate of the probability that the target biomass will be met at any time before the specified year. This technique can be used first to calculate $T_{\text{MIN}}$ in probabilistic terms, which is defined as the time needed to reach the target biomass in the absence of fishing with a 50% probability. Thus, if 1,000 simulations are run with $F=0$, the number of simulations reaching the target biomass in a given year can be progressively summed (or cumulated) starting with the first year set for the simulations and running out to some maximum number of years (which could be the simulation in which the population took the longest time to reach the target biomass or a predetermined maximum value). In this example $T_{\text{MIN}}$ would be determined by finding the year in which this cumulative value equals 500. In other words, in half the simulations the target biomass was reached in some year up to and including the computed $T_{\text{MIN}}$. Given $T_{\text{MIN}}$ and assuming that it is greater than or equal to 10 years (as is the case with most of the overfished groundfish stocks), $T_{\text{MAX}}$ is computed by adding the value of one mean generation time.

$T_{\text{TARGET}}$ is determined in a similar way. It is defined as the amount of time needed to reach the target biomass—given some level of fishing mortality—with a 50% probability. (In the absence of fishing $T_{\text{TARGET}}$ and $T_{\text{MIN}}$ are thus the same value.) This can be considered the median year because half of all simulations reached the target biomass in the time period up to $T_{\text{TARGET}}$ and half in the time period after.

Although the target year is identified in the MSA and national standards guidelines, the rebuilding analyses compare different harvest policies using a single standard: for a given level of fishing mortality, the probability of achieving the target biomass within the maximum allowed time period ($T_{\text{MAX}}$). The same type of Monte Carlo simulation can be used to determine this probability as was just described for determining $T_{\text{MIN}}$ and $T_{\text{TARGET}}$. Figure 1-2 is a plot of the individual year and cumulative probability distributions for a given level of fishing mortality from the bocaccio analysis. The cumulative probability reaches 50% at $T_{\text{MAX}}$, which is 78 years from the start of rebuilding. This $T_{\text{MAX}}$ probability means that 50% of the simulations reached the target biomass at some point in those 78 years. (In this case $T_{\text{TARGET}}$ equals $T_{\text{MAX}}$ because both are specified by the 50% probability. With an increased $T_{\text{MAX}}$ probability, necessitating a reduction in fishing mortality, $T_{\text{TARGET}}$ would occur earlier.)

Figure 1-2 shows the percent of simulations reaching the target biomass in each year (represented by the bars) and two cumulative probabilities (lines). The solid line sums simulations that have reached the target biomass in any of the preceding years even if biomass declines below the target in subsequent years due to the kind of recruitment variability illustrated in Figure 1-1b. The dashed line cumulates only those trajectories that reach the target biomass and stay above it thereafter. This cumulative probability is comparatively lower, and for $T_{\text{MAX}}$ is only 30% for the Monte Carlo simulation shown in Figure 1-2. It is important to appreciate this distinction and understand that the $T_{\text{MAX}}$ probabilities used in rebuilding analyses are calculated the first way, expressing the likelihood of reaching the target biomass but not necessarily remaining above it.

The rebuilding analysis computer program is actually initialized with a given probability and iteratively searches for the level of fishing mortality that gives that probability. But from a policy-making standpoint the essential tradeoff is between a given level of fishing mortality and the probability that the stock will be rebuilt within the maximum permissible time period ($T_{\text{MAX}}$). Although computationally there is a prescribed relationship, with the $T_{\text{MAX}}$ probability as an input value, policy makers may wish to base their decisions on $T_{\text{MIN}}$, $T_{\text{TARGET}}$, or the probability of reaching the target biomass. In doing so it is important to keep in mind the relationship between these parameters. Fundamentally, the policy maker only chooses the tradeoff between fishing mortality and the probability of rebuilding by $T_{\text{MAX}}$. Figure 1-3 illustrates this tradeoff in the widow rockfish rebuilding analysis. Note that the relationship is not linear and that incremental cost (in terms of catch reductions) increases rapidly at the low risk margin and that a 100% probability cannot be achieved even in the absence of fishing. Instead of choosing the fishing mortality level (or $T_{\text{MAX}}$ probability) the policy maker could choose any year between $T_{\text{MIN}}$ and $T_{\text{MAX}}$ as the target year (as long as the resulting probability is equal to or greater than the default value of 50%); once fishing mortality has been fixed, the choice of $T_{\text{TARGET}}$ simply determines the probability that it will be achieved. Note that choosing some $T_{\text{TARGET}}$ other than the default does not influence the underlying policy variable, which is the level of fishing mortality. The default $T_{\text{TARGET}}$ value is determined by its probability (50%). If the fishing mortality level has
already been chosen, identifying some other \( T_{\text{TARGET}} \) value would only affect the probability of achieving target biomass by the year chosen, but does not change the rebuilding trajectory.

As the preceding discussion suggests, probability statements about \( T_{\text{MAX}} \) or \( T_{\text{TARGET}} \) tell us the likelihood of an outcome based on our understanding of a fish stock and our ability to model how that stock will grow over time. Since our understanding of these population characteristics is imperfect, some sources of uncertainty are not captured in the aforementioned probability statements. First, inputs to the rebuilding analysis are to a greater or lesser degree best estimates of true values. This applies to basic biological parameters, such as fecundity, that are used to model population growth. Population projections also depend on and estimate of the size and age structure of the modeled stock at the outset of the projected time period, derived from the most recent stock assessment. Similarly, the biomass target \( (B_o) \) requires an estimate of the equilibrium population size that would be reached in the absence of fishing (see Box). In all these cases the best estimate may not coincide with the true value. The Monte Carlo simulation used in the rebuilding analyses only considers uncertainty about future recruitment, so inaccuracy in the estimation of both species and stock-specific variables will not be captured in resulting probability statements. Finally, there is some uncertainty (or variability) inherent to the Monte Carlo simulation because any one “run” (set of projections) will not include all possible outcomes. This variability can be assessed by invoking several runs and measuring the variation in the output value (fishing mortality for a given \( T_{\text{MAX}} \) probability) among these runs (Punt 2002a). This type of assessment can be used to establish a range around a point estimate (the mean value) expressing the likelihood that the true value falls within that range.6

New information may result in new estimates of biological and stock parameters, and assessed uncertainty in the Monte Carlo simulation tell us something about the range of possible outcomes. But rebuilding trajectories will also change over time with new stock assessments and as historical data (such as total catch estimates for past years) replaces projected values. Time targets—\( T_{\text{MIN}}, T_{\text{MAX}}, \) and \( T_{\text{TARGET}} \)—fall along a time scale that begins when the stock is declared overfished \((Y_{\text{crit}})\). Because the rebuilding analysis is usually conducted from one to several years after \( Y_{\text{crit}} \) a more recent stock assessment may allow population growth to be projected from the most recent year for which stock structure data (such as mortality, weight, and number of animals for each age class in the population) are available. In subsequent analyses (conducted as new stock assessment data become available) the pool of historical recruitment values will likely differ (with addition of the most recent years' data) and the there will be fewer years for which population growth is projected. (This assumes that \( T_{\text{MAX}} \) is not re-computed because, for example, changes in stock structure produce a different value for mean generation time.). It is highly likely that the new analysis will suggest a different level of fishing mortality to achieve the same \( T_{\text{MAX}} \) probability (and by extension \( T_{\text{TARGET}} \) value, or probability if the target year is fixed). Conversely, if the policy maker wishes to continue with the same harvest policy—a given fishing mortality rate for example—the \( T_{\text{MAX}} \) probability would likely be different in the new analysis.

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6 These assessments demonstrates three important points. First, different modeled species will produce different degrees of variability when comparing runs because of the underlying variability in the input recruitment data. Second, for a given species and \( T_{\text{MAX}} \) probability increasing the number of simulations in a run decreases uncertainty (or relative variability). But this decrease is not constant; above a certain run size there are diminishing returns for further increases in the number of simulations. Finally, for a given species and run size choosing a lower \( T_{\text{MAX}} \) probability increases certainty (by decreasing the range of possibly "correct" values for fishing mortality, or OY).

6 National Standard guidelines identify the initial rebuilding year, for the purpose of calculating targets, as the year in which rebuilding measures were first implemented. For overfished Pacific groundfish this would be the year in which interim rebuilding plan measures were implemented as part of the annual management process. In most cases this was the either \( Y_{\text{crit}} \) or the following year.
Estimation of Virgin Biomass

Target biomass is directly related to $B_0$, or "virgin (unfished) biomass." (It is expressed as a percentage of this value.) Target biomass in turn affects the rebuilding trajectory described by $T_{MIN}$, $T_{MAX}$ and $T_{TARGET}$. $B_0$ is rarely known absolutely; instead it is calculated based on the relationship between the number of spawning fish and resulting recruits to the fishable population. Modelers choose a time period for which data are available and fishing effort has been at a stable and relatively moderate level. The choice of time period is complicated because biologists are unsure how important environmental conditions are to survival and growth versus spawning population size, which posit a "density dependent" spawner to recruitment relationship. (For groundfish this relationship is believed to be positive: a larger spawning population results in greater total recruitment.) For Pacific coast groundfish these two factors have historically had potentially confounding effects. A large-scale regime shift began in 1977; many scientists believe that generally warmer water produced less favorable conditions for groundfish. The period after 1977 also saw a decline in groundfish populations due to increased fishing effort. If an environmental explanation is favored, one would choose a long time series that encompassed recruitment both before and after 1977 in order to account for the impact of the environmental change. However, this will result in a relatively lower value for $B_0$ than only using recruitment values before 1977 when biomass and recruitment were closer to an unfished state. The SSC also discusses a third approach in its Terms of Reference, using spawner-recruit models instead of relying solely on empirical data. These models are problematic because they mathematically presuppose a certain spawner-recruit relationship. The overfished species being modeled may not exhibit this relationship because of its particular biology and ecology. The SSC recommends determining $B_0$ based on the density-dependent hypothesis and therefore using earlier data (resulting in relatively large values for $B_0$). It can be seen that uncertainty about stock dynamics requires scientific judgement. This is not a policy choice (which involve trade-offs between different social values). But these judgements do affect the variables that influence policy choices since other parameters, such as target biomass, are defined in relation to $B_0$. 
Figure 1-1a: Example of five population growth simulations for widow rockfish for a given F. (Source: Andre Punt. Note: Plots are illustrative and may not correspond to actual rebuilding analysis results.)
Figure 1-1b: Example of five population growth simulations for bocaccio for a given F. (Source: Andre Punt. Note: Plots are illustrative and may not correspond to actual rebuilding analysis results.)
Figure 1-2: Rebuilding analysis for bocaccio at a given F and with a Tmax probability of 50%. (Source: Andre Punt. Note: Plots are illustrative and may not correspond to actual rebuilding analysis results.)
Figure 1-3: Example of F versus T_max probability, widow rockfish rebuilding analysis. (Source: Andre Punt. Note: Plots are illustrative and may not correspond to actual rebuilding analysis results.)
1.3.3 Summary of the Current Management Regime

Draft rebuilding plans and rebuilding analyses have been used since 2000 to guide the Council in deciding management measures for overfished groundfish stocks. Provisions in Amendments 11 and 12 of the FMP established a framework for their development and implementation, in a way thought to be consistent with the Sustainable Fishing Act (or SFA, which re-authorized the MSA and added new provisions). As specified in these draft rebuilding plans, rebuilding management measures would be adopted through the Council's annual process of setting harvest specifications for the groundfish fishery. In addition to the draft rebuilding plans, rebuilding analyses (which are written by the stock assessment authors) and the Environmental Assessment for each year's harvest specifications (used in the Council/NMFS decision making process) take into account the scientific and legal constraints on harvests imposed by the need to rebuild overfished groundfish fisheries. Although the Council has respected these constraints in its decisions to date, NMFS has the authority to reject these decisions because in the regulatory context they only represent recommendations to the Secretary of Commerce.

The Council has typically chosen a risk-averse strategy when deciding on harvest levels for overfished stocks, based on recommendations contained in rebuilding analyses and given by the Council's advisory bodies. Total mortality has been controlled by reducing trip and landing limits for co-occurring species in select target fisheries, gear restrictions (i.e., the small-footprint specification for landing shelf rockfish), seasonal closures (i.e., the recreational groundfish fishery seasons adopted in California), and area closures (i.e., the Cowcod Conservation Area closures in southern California).

The actual discard rate (or bycatch) of fish species that are overfished, which may differ among the various groundfish fishery sectors, is a critical uncertainty that must be addressed if effective measures to control total mortality and thus achieve rebuilding objectives are to be adopted. Limited data have been available to base these estimates. Therefore, bycatch and discard rate assumptions have been contentious and the focus of some recent legal challenges. However, NMFS implemented an observer program in August 2001, which allows direct observation of commercial bycatch and discard. Data from this program, available in the near future, will promote more informed management decisions and effectively control total mortality of overfished groundfish stocks.

1.3.2 Summary of Litigation over Amendment 12

In January 2000 the Natural Resources Defense Council along with other conservation organizations challenged the adequacy of Amendment 12 (Natural Resources Defense Council v. Evans) in Federal District Court. They claimed that rebuilding plans submitted pursuant to Amendment 12 were inadequate for two reasons. First, they did not take the form of fishery management plans, plan amendments, or regulations as required by the MSA. Second, rebuilding plans could allow overfishing under the “mixed-stock exception.” The NRDC argued that the overfishing provisions in the SFA demonstrate Congress’s intent to eliminate this exception so rebuilding plans should not entertain this exception. The Plaintiffs also argued that the Environmental Assessment accompanying Amendment 12 failed to consider a reasonable range of alternatives as required by NEPA. The Court found for the Plaintiffs on the claim that rebuilding measures must conform to the MSA-mandated format of a plan, amendment, or regulation and the NEPA-related claim of an inadequate range of alternatives. The Court decided that the second MSA-related claim, on the validity of the mixed-stock exception, was not ripe for judicial review because the exception had not yet been applied to Pacific groundfish management. In response to its findings, the Court ordered NMFS to revise Amendment 12 so that the rebuilding plan implementation process accords with MSA and NEPA requirements.

1.4 Scoping Summary

The Council process offers many opportunities to determine the scope of issues and effects relevant to an EIS. The scope includes the extent of the action, the range of alternatives considered and the types of impacts that are analyzed (40 CFR 1508.25). This work is carried out by NMFS and Council staff, advisory bodies and at Council meetings, which are open to the public.
Scoping began in early 1999 with the approval of Amendment 11 to the Groundfish FMP. This amendment established a new definition for what constituted an overfished stock and three groundfish stocks (lingcod, bocaccio rockfish and Pacific ocean perch) qualified under this definition. This meant that the Council had to begin developing rebuilding plans for these species. As an indication of the extent of scoping, discussion of rebuilding at Council meetings is summarized here.

April 1999. It was noted that the MSA required preparation of rebuilding plans within one year of an overfishing declaration, meaning that management measures would have to be in place before the March 2000 Council meeting. However, annual management measures (which determine harvest levels) are established during the fall Council meetings in the preceding year, meaning that analysis would have to be completed for the 1999 September and November meetings. It was recognized that allocation and bycatch were important rebuilding-related issues. The Council's Ad-Hoc Allocation Committee presented allocation options for lingcod and bocaccio under rebuilding scenarios. Since allowable harvest for these species was already low, allocation decisions were related to the effect of incidental catches on harvest opportunities for other species that are not overfished. Advisory bodies to the Council provided comments, mostly related to procedural issues. Among other things, the Council discussed how changes could be made to the rebuilding plan in the event that a stock recovered more quickly than anticipated.

June 1999. The Council considered procedures for rebuilding plan adoption. Staff recommended that adoption have three components: an FMP amendment that specifies the time period and anticipated allocation issues, a "source document" containing technical analyses, and an environmental assessment analyzing alternative rebuilding strategies. These procedures would apply to each overfished species, although the FMP could contain "generic" rebuilding goals and objectives. Preliminary analyses for lingcod, bocaccio and Pacific ocean perch were presented. Written comments from a fishermen's association and an environmental group focused on the appropriate amount of catch reduction, the problem of accounting for and reducing bycatch of overfished species, and allocation among fishery sectors. Scientific and industry advisory bodies commented on the draft rebuilding plans. Aside from technical comments, these groups recognized the high degree of uncertainty associated with predicting stock rebuilding because of limits on fishery and habitat information. The Council recognized the importance of public participation in formulating rebuilding plans. A representative of the Natural Resources Defense Council spoke during public comment.

September 1999. The Council reviewed the draft plan amendment (Amendment 12) for rebuilding overfished species. The draft amendment described how rebuilding plans would be developed and reviewed but would not include rebuilding measures. These would implemented through the annual management process that sets catch limits for groundfish fisheries. Rebuilding analyses showed that even at high levels of risk (low probability of stock recovery) annual catch levels would have to be substantially reduced. The draft amendment document contained two action alternatives: amending the FMP to adopt each rebuilding plan or creating a framework in the FMP that describes the process for developing and implementing rebuilding plans, but without incorporating the rebuilding plans into the FMP through the amendment process. Rebuilding analyses for overfished species were presented and reviewed. The Council moved to put the draft amendment out for public review, but recommended that the alternative requiring all rebuilding plans be plan amendments be dropped since this would be too burdensome a process. Public hearings were slated for the next Council meeting. Written comments from the Pacific Marine Conservation Council recommended balancing measures to prevent overfishing against impacts to fishing communities, adopting risk averse rebuilding targets, allocating cuts fairly, and using best available science. The California Department of Fish and Game submitted proposals for the management and allocation of depleted species, including the southern bocaccio stock. As part of this process it held two public scoping meetings. The Council also had to consider 2000 management measures that accounted for overfished species. This involved management strategies that would allow harvest of healthy stocks while minimizing impacts to those that were overfished. Public comments were received from six individuals representing environmental groups (Pacific Marine Conservation Council, Pacific Ocean Conservation Network, Natural Resources Defense Council), fishing interests and the Oregon Coastal Zone Management Association.
November 1999. The Council reviewed a revised draft of the amendment document (environmental assessment) containing two alternatives, no action and implementation of a framework amendment, but decided to defer adoption until its April 2000 meeting. Rebuilding measures for bocaccio, lingcod and Pacific ocean perch were adopted, however. The Environmental Defense Fund submitted written comments recommending that closed areas be considered for managing overfished stocks. The Habitat Steering Group, a Council advisory body, recommended that habitat information be included in the rebuilding plans and that plans should incorporate management tools based on the habitat requirements of overfished stocks. The Groundfish Advisory Subpanel (GAP) urged the adoption of better data collection and fishery monitoring. It also supported a “phase-in” rebuilding strategy for bocaccio with two dissents advocating lower initial harvest levels. Public comment was heard from nine individuals, including four representing conservation groups (Center for Marine Conservation, Pacific Marine Conservation Council, Natural Resources Defense Council, Environmental Defense Fund); the remainder were fishermen or representatives of fishing organizations.

April 2000. The Council did not take up rebuilding plan measures at its March meeting. The Council approved Amendment 12 (Option 2), which as described above established a process for adopting rebuilding measures as part of the annual management process. The amendment also declares groundfish to be fully utilized, meaning that foreign entities may not harvest or process these resources. The Council moved for modifications to the amendment with respect to the allocation of overfished stocks among fishery sectors. In January 2000 NMFS declared two additional groundfish species overfished (cowcod and canary rockfish). Rebuilding plans for these two species would have to be developed and submitted to NMFS by the end of 2000. The Council adopted a process for developing rebuilding plans for these species that would allow implementation through 2001 management measures. Public comment was taken from a representative of the Coos Bay Trawler’s Association and a commercial fisherman.

June 2000. The Council was advised that the three submitted plans and two draft plans (for cowcod and canary rockfish) would have a substantial impact in terms of reductions in the allowable catch. They were asked to consider whether to incorporate review of rebuilding analyses into the current stock assessment review process or develop an alternative review process. It was noted that the MSA requires Secretarial review at least every two years. NMFS outlined a recommended process for technical review and monitoring of rebuilding plans. Advisory bodies made several recommendations for modification of the process and review schedule. The Council also discussed the two draft plans and recommended that the Ad-Hoc Allocation Subcommittee take up consideration of how to deal with the impact of very low allowable catches necessitated by the increased number of overfished species. Incidental catch in fisheries not managed by the Council would be an important consideration. Three individuals gave public testimony, two from environmental groups (Pacific Marine Conservation Council, Center for Marine Conservation) and one from the fishing industry (Oregon Trawl Commission).

September 2000. The Council considered rebuilding schedules and harvest levels for cowcod and canary rockfish. Staff noted that although only the cowcod stock in the Conception management area (Southern California) had been considered in the overfishing assessment, the Monterey portion (Central California) was almost certainly also overfished. The extremely low abundance and productivity of this stock restricts rebuilding options, but the limited distribution of the stock would confine impacts to a discrete geographic area. The California Department of Fish and Game proposed closing two areas in Southern California waters to bottom fishing to reduce cowcod fishing mortality. Canary rockfish are much more widely distributed and management measures would affect several fisheries, including pink shrimp and recreational fisheries. Choosing a rebuilding strategy was made difficult due to uncertainty about the maximum age and survival of female fish. Surveys show few older female fish, but this could be because they avoid capture. If they are indeed scarce (assuming the are not avoiding capture) allowable catches would have to be reduced more and rebuilding would take longer. The Ad-Hoc Allocation Committee met in advance of the September meeting to develop recommendations related to overfished species, which were presented at this Council meeting. Four individuals made public comments, two from environmental groups (Natural Resources Defense Council, Center for Marine Conservation) one from a recreational fishing group (United Anglers of California) and a private citizen.
November 2000. The Council adopted rebuilding plans for canary rockfish and cowcod. Written comment was received from the Natural Resources Defense Council (NRDC), the Center for Marine Conservation (CMC) and two commercial fishermen. The NRDC letter raised a range of concerns, arguing that Amendment 12 and subsequent rebuilding plans did not adequately comply with the MSA and NEPA. These issues also appear in the lawsuit brought against NMFS over Amendment 12 by NRDC in early 2000. The CMC letter argued that there was insufficient data on total fishing mortality and that the rebuilding plans did not specify management measures, as required by the MSA. The commercial fishermen argued that scientific assessments of cowcod were inaccurate and suggested various measures, including artificial propagation and the use of decommissioned structures to enhance habitat, to restore stocks. Designation of large closed areas was also suggested. Advisory bodies also commented on the rebuilding plans. Issues of concern included appropriate harvest levels to balance rebuilding against short-term economic losses, enforceability of management measures, allocation (especially between commercial and recreational sectors), and difficulties with monitoring, especially the recreational sector. Twenty-two people gave public comment; two represented conservation organizations (Center for Marine Conservation, Pacific Marine Conservation Council), the remainder were fishers or representatives of fishing organization.

NMFS announced the final rule approving Amendment 12 in the Federal Register on December 29, 2000 (65 FR 82947). In approving Amendment 12 NMFS revoked prior approval of the lingcod, bocaccio, and Pacific ocean perch rebuilding plans because “they do not meet all of the rebuilding requirements described in Amendment 12, and [protection measures] are not adequately explained and analyzed.” Groundfish fisheries would continue to operate under the terms of these rebuilding plans, however. The Federal Register notice also contains responses to comments received from two parties. The main concerns expressed in these comments was that Amendment 12 does not require rebuilding plans to be plan amendments or regulations, and that the plans do not meet all of the requirements of the MSA.

April 2001. Widow rockfish and darkblotted rockfish were declared overfished as a result of assessments completed before this meeting, bringing the total number of overfished species to seven. At this meeting the Council reviewed the form and content of rebuilding plans (or terms of reference for rebuilding plan authors), and procedures for preparation and adoption of plans in 2001. The schedule would allow 2002 management measures, which would be adopted at the November 2001 meeting, to incorporate rebuilding plan targets. Adoption of the canary rockfish cowcod rebuilding plans, revised in light of the issues that caused NMFS to revoke approval of the three already-adopted plans, was considered but deferred until the next meeting. The canary rockfish plan was seen as model for all other rebuilding plans and the Council wanted more time to review the plan and more opportunity for public comment. The Habitat Steering Group, among other things, recommended that rebuilding plans identify habitat and habitat impacts, and discuss the feasibility of creating marine reserves to manage the overfished species in question. Council members discussed and generally supported the recommendations without moving to make them a requirement of rebuilding plans. Public comment was heard from representatives of the CMC and the Pacific Marine Conservation Council.

June 2001. The Council again reviewed the seven rebuilding plans in various stages of preparation. Three (cowcod, bocaccio, and canary rockfish) were slated for adoption but the Council deferred and directed staff to further expand various elements in these plans, including bycatch accounting and habitat designation. New analyses were requested for Pacific ocean perch and lingcod, incorporating a new stock assessment for lingcod and using the standardized analytical procedures (terms of reference) approved at the last meeting. Rebuilding alternatives for widow rockfish management were adopted for consideration; these management measures would cut potential harvests by as much as two-thirds in comparison to the current year. The Groundfish Advisory Subpanel, representing fishers, expressed its frustration that inadequate funding resulted in inadequate monitoring and assessment, in turn necessitating substantial reductions to rebuild overfished species. NRDC and the CMC submitted written comments. The NRDC comments again covered the points under litigation, including the fact that rebuilding measures were not incorporated into the FMP; and that the draft plans do not meet the statutory requirements for rebuilding overfished stocks, and adequately account for bycatch or essential fish habitat. The CMC comments focused on the canary rockfish rebuilding plan, arguing the estimates of recruitment were too optimistic.
and bycatch estimates too low. Public comments came from representatives of the Pacific Marine Conservation Council, NRDC and the CMC.

September 2001. The Council deferred adoption of final rebuilding plans for canary rockfish, cowcod and bocaccio to allow staff to focus on developing 2002 management measures, which they would vote on at the November meeting. They also reviewed analyses for other overfished species. The complaint brought by NRDC in Federal District Court over Amendment 12 (consolidated with a subsequent complaint) was decided in August. The amendment was remanded. The Council briefly discussed the resulting need to develop a new amendment for rebuilding plans. There was no written or oral public comment.

November 2001. Declaration of an eighth overfished groundfish species, yelloweye rockfish, was anticipated at this meeting. This required developing management measures specifically for yelloweye stocks; in the past this species had been managed as part of a multi-species complex. The Council considered guidance on the completion of the rebuilding plans in light of the remand of Amendment 12. The Council also had to incorporate rebuilding plan measures into the 2002 management measures considered at this meeting. The Groundfish Advisory Subpanel recommended that rebuilding plans should consider the socioeconomic impacts of rebuilding measures and be flexible enough to accommodate new information as it become available. There was no written or oral public comment.

March/April 2002. During these two meetings the Council considered the schedule for completion of the revised rebuilding plan amendment (consequent of the Court's remand), numbered Amendment 16 and constituting the document before you. Although the Court directed speedy completion of the Amendment, the likelihood that new stock assessment information would become available in the first half of 2002, which would figure in the substance of the amendment, called for some delay. Ultimately, it was agreed that a draft of Amendment 16 would be brought before the Council in June. The Council was also advised that not all rebuilding plans would be included in the Amendment 16 package; remaining plans would be incorporated in a later amendment. In 2002 Pacific whiting became the ninth groundfish species to be declared overfished. This required a substantial reduction in harvests during 2002. (Whiting are harvested from April to November and the Council sets harvest limits for this species at its March meeting.) NMFS overruled the Council's recommendation, instituting a lower harvest level by emergency rule. NMFS and the Council published a notice of intent to prepare an EIS for Amendment 16 in the Federal Register on April 16 (67 FR 18576).

Relevant Issues

Scoping has two related purposes: to identify significant environmental issues that deserve study (40 CFR 1500.4(g)) and to eliminate from detailed study those issues that are not significant or have already been analyzed in other documents (40 CFR 1501.7(a)(3)). As the preceding summary reveals, rebuilding of overfished stocks has been on the Council's agenda for two and a half years. Council deliberations, advisory body discussion, and public comment—all of which are part of the Council process—have allowed considerable opportunity to scope rebuilding plan-related issues. NOAA Administrative Order (NAO) 216-67 and Council on Environmental Quality (CEQ) regulations implementing NEPA provide a general framework for organizing issues that have been identified and ensuring that all relevant issues have been considered. Both these sources provide criteria for determining whether the environmental impacts of a proposed action (and its alternatives) are significant. They can thus be used to bound the "universe" of potential issues and actions.

First, NAO 216-6 (Section 6.02) lists guidelines for determining the significance of fishery management actions. The guidelines direct consideration of effects on: (1) target species, (2) non-target species, (3) habitat, (4) public health or safety, (5) protected species (e.g., listed under the ESA or MMPA) and their habitat, (6) biodiversity and ecosystem function, and (7) the socioeconomic environment as it relates the natural environment. There are two additional guidelines that do not fit readily into the preceding topic-

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7 This document provides agency guidance on implementing NEPA.
specific list (8) cumulative effects on target and non-target species; and (9) the degree of controversy related to the effects of an action, although "no action should be deemed to be significant based solely on its controversial nature."

Second, CEQ regulations define significance at an even more general level (40 CFR 1508.27) in terms of both context and intensity:

(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

Finally, CEQ regulations (40 CFR 1502.16) list factors that shall be considered when assessing the environmental consequences of an action in an EIS. This list is somewhat duplicative, but salient elements include the need to consider "(c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned,...(e) Energy requirements and conservation potential of various alternatives and mitigation measures. (f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures. (g) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures. (h) Means to mitigate adverse environmental impacts..."

Table 1-1 incorporates the criteria described in these sources and gives a brief assessment of their likely significance. This screening process serves as the basis for the affected environment descriptions and environmental consequences analyses found in the procedural component (Part A) and rebuilding plans (Parts B and higher) that make up this amendment document.
Table 1-1: Potential effects of rebuilding procedural measures and rebuilding plans.

<table>
<thead>
<tr>
<th>Affected Environment</th>
<th>Potential effects of the proposed action (and whether direct, indirect or cumulative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Effect is primarily a consequence of: (1) Procedural measures, (2) Rebuilding plan implementation</td>
</tr>
<tr>
<td>Biological</td>
<td></td>
</tr>
<tr>
<td>Target species or stocks (overfished stocks)</td>
<td></td>
</tr>
<tr>
<td>Abundance and present condition</td>
<td>✔️ Rebuilding plans will have moderate to significant beneficial direct impact, because abundance will increase due to reducing fishing mortality; depending on rebuilding trajectory benefits may only emerge in the long-term. Complex cumulative impacts due to possible increases in regulatory discards of constraining stocks.</td>
</tr>
<tr>
<td>Population parameters (recruitment, age structure, spawning potential, etc.)</td>
<td>✔️ Population structure, recruitment and other parameters will change over the long term as a direct impact of rebuilding plan implementation. Significant benefits likely.</td>
</tr>
<tr>
<td>Ecological relationships</td>
<td>✔️ Complex indirect and cumulative effects due to changes in relative abundance of co-occurring species. Effects beneficial may be beneficial depending on changes to ecosystem structure.</td>
</tr>
<tr>
<td>Probable future condition</td>
<td>✔️ Significant positive direct impact if proposed action restores overfished stocks.</td>
</tr>
<tr>
<td>Overfishing and rebuilding overfished stocks</td>
<td>✔️ ✔️ Proposed action prevents overfishing (i.e., F &gt; MFMT) on overfished stocks, although current policies intended to prevent overfishing on all stocks. Overfished stocks rebuilt if proposed action successful (i.e., stock biomass &gt; MSST). Significant direct and indirect benefits impacts likely</td>
</tr>
<tr>
<td>Regulatory discards (target bycatch)</td>
<td>✔️ Without discard caps or retention policies could increase regulatory discards if management is through landing limits. Without adequate monitoring total fishing mortality could be underestimated. Potentially significant adverse impacts.</td>
</tr>
<tr>
<td>Other species occurring in the fishery</td>
<td></td>
</tr>
<tr>
<td>(including management unit species)</td>
<td></td>
</tr>
<tr>
<td>Abundance and present condition</td>
<td>✔️ No direct effect. Could indirectly reduce fishing mortality if overfished species become constraining stocks and/or management measures also reduce fishing mortality to non-overfished stocks.</td>
</tr>
<tr>
<td>Ecological relationships</td>
<td>✔️ Indirect and cumulative impacts due to changes in relative abundance of overfished species. Effect uncertain.</td>
</tr>
<tr>
<td>Probable future condition</td>
<td>✔️ Negligible to moderate positive impact if fishing mortality on all MUS reduced as a consequence of restrictions on overfished species.</td>
</tr>
<tr>
<td>Discards (regulatory and/or economic bycatch)</td>
<td>✔️ Unlikely to affect other MUS discards because overfished species act as constraining stocks.</td>
</tr>
<tr>
<td>Affected Environment</td>
<td>Potential effects of the proposed action (and whether direct, indirect or cumulative)</td>
</tr>
<tr>
<td>----------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Habitat (includes EFH)</td>
<td>Effect is primarily a consequence of: (1) Procedural measures, (2) Rebuilding plan implementation</td>
</tr>
<tr>
<td>Type and extent</td>
<td>No effect</td>
</tr>
<tr>
<td>Condition</td>
<td>✓ Possible indirect effect if habitat-damaging fishing gear effort is reduced or closed areas implemented.</td>
</tr>
<tr>
<td>Non-fishing-related threats- activities that have potential adverse effects on EFH quantity and quality</td>
<td>No effect</td>
</tr>
<tr>
<td>Biodiversity and Ecosystem Function</td>
<td></td>
</tr>
<tr>
<td>Trophic levels above and below species caught in the fishery</td>
<td>✓ Negligible to moderate positive indirect effect. Overfished species abundance increases, making them more available as predators and prey.</td>
</tr>
<tr>
<td>Distribution of species in marine ecosystem, local and regional biodiversity</td>
<td>✓ Moderate direct effect on biodiversity if extinctions (at whatever geographic scale) occur or are prevented.</td>
</tr>
<tr>
<td>Protected species</td>
<td></td>
</tr>
<tr>
<td>Marine mammals</td>
<td>✓</td>
</tr>
<tr>
<td>mortality/injury</td>
<td>✓ Negligible to moderate positive indirect effect correlated to change (reduction) in fishing effort.</td>
</tr>
<tr>
<td>ecosystem/habitat</td>
<td>✓ Negligible positive indirect effect due to increase in prey availability (if species consumes overfished species).</td>
</tr>
<tr>
<td>ESA-listed</td>
<td>✓</td>
</tr>
<tr>
<td>mortality/injury</td>
<td>✓ Same as above.</td>
</tr>
<tr>
<td>ecosystem/habitat</td>
<td>✓ Same as above.</td>
</tr>
<tr>
<td>Seabirds</td>
<td>✓</td>
</tr>
<tr>
<td>mortality/injury</td>
<td>✓ Negligible to moderate effect depending on reductions in fishing effort by longline vessels, which have some seabird bycatch.</td>
</tr>
<tr>
<td>ecosystem/habitat</td>
<td>✓ Negligible positive indirect effect due to increase in prey availability (if species consumes overfished species).</td>
</tr>
<tr>
<td>Affected Environment</td>
<td>Potential effects of the proposed action (and whether direct, indirect or cumulative)</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Socioeconomic</td>
<td>Effect is primarily a consequence of: (1) Procedural measures, (2) Rebuilding plan implementation</td>
</tr>
<tr>
<td>FMP fisheries overall</td>
<td>✓  Potentially significant direct and cumulative effects due to required reductions in catch.</td>
</tr>
<tr>
<td>Allocation between sectors</td>
<td></td>
</tr>
<tr>
<td>Commercial catch and value,</td>
<td></td>
</tr>
<tr>
<td>recreational catch and effort</td>
<td></td>
</tr>
<tr>
<td>Capital and labor (number of</td>
<td></td>
</tr>
<tr>
<td>vessels and firms, employment)</td>
<td></td>
</tr>
<tr>
<td>Markets: sales, prices</td>
<td></td>
</tr>
<tr>
<td>(exvessel, wholesale, retail,</td>
<td></td>
</tr>
<tr>
<td>etc.), number and extent</td>
<td></td>
</tr>
<tr>
<td>International trade (imports</td>
<td></td>
</tr>
<tr>
<td>and exports)</td>
<td></td>
</tr>
<tr>
<td>Energy requirements and</td>
<td></td>
</tr>
<tr>
<td>energy conservation</td>
<td></td>
</tr>
<tr>
<td>Resource seasonality and use</td>
<td></td>
</tr>
<tr>
<td>Social and cultural importance of the resource</td>
<td></td>
</tr>
<tr>
<td>Commercial Sector</td>
<td>✓  Potentially significant direct and cumulative effects due to required reductions in catch.</td>
</tr>
<tr>
<td>Allocation by region or gear groups</td>
<td></td>
</tr>
<tr>
<td>Catch and value by gear/vessel type</td>
<td></td>
</tr>
<tr>
<td>Capital and labor (number of vessels, employment) by gear/vessel type</td>
<td></td>
</tr>
<tr>
<td>Investment, revenue, costs,</td>
<td></td>
</tr>
<tr>
<td>effort, efficiency, productivity</td>
<td></td>
</tr>
<tr>
<td>Markets: sales, exvessel</td>
<td></td>
</tr>
<tr>
<td>prices, number and extent</td>
<td></td>
</tr>
<tr>
<td>Resource seasonality and use</td>
<td></td>
</tr>
<tr>
<td>Demographics, ethnic and</td>
<td></td>
</tr>
<tr>
<td>social characteristics</td>
<td></td>
</tr>
<tr>
<td>Dependence of groups on</td>
<td></td>
</tr>
<tr>
<td>fishing for employment/income</td>
<td></td>
</tr>
<tr>
<td>Affected Environment</td>
<td>Potential effects of the proposed action (and whether direct, indirect or cumulative)</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Social and cultural importance of the resource</td>
<td>Effect is primarily a consequence of: (1) Procedural measures, (2) Rebuilding plan implementation</td>
</tr>
<tr>
<td>Recreational fishery overall</td>
<td>Moderate to significant direct and cumulative impacts due to loss of fishing opportunity.</td>
</tr>
<tr>
<td>Allocation by region or gear groups, charter and private recreational</td>
<td></td>
</tr>
<tr>
<td>Catch and imputed value, charter and private recreational</td>
<td></td>
</tr>
<tr>
<td>Non-market value, charter and private recreational</td>
<td></td>
</tr>
<tr>
<td>Resource seasonality and use</td>
<td></td>
</tr>
<tr>
<td>Private recreational</td>
<td></td>
</tr>
<tr>
<td>Resource seasonality and use</td>
<td></td>
</tr>
<tr>
<td>Support industries: investment and revenue</td>
<td></td>
</tr>
<tr>
<td>Demographics, ethnic and social characteristics</td>
<td></td>
</tr>
<tr>
<td>Social and cultural importance of the resource</td>
<td></td>
</tr>
<tr>
<td>Charter industry</td>
<td></td>
</tr>
<tr>
<td>Allocation by region or sub-sector</td>
<td></td>
</tr>
<tr>
<td>Catch, effort and aggregate revenue</td>
<td></td>
</tr>
<tr>
<td>Capital and labor (number of vessels, employment)</td>
<td></td>
</tr>
<tr>
<td>Investment, revenue, costs, effort, efficiency, productivity</td>
<td></td>
</tr>
<tr>
<td>Demographics, ethnic and social characteristics</td>
<td></td>
</tr>
<tr>
<td>Dependence of employed groups on charter fishing for employment/income</td>
<td></td>
</tr>
<tr>
<td>Social and cultural importance of the resource</td>
<td></td>
</tr>
<tr>
<td>Affected Environment</td>
<td>Potential effects of the proposed action (and whether direct, indirect or cumulative)</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Buyers and Processors</td>
<td>Moderate to large direct impact due to reduced availability of product.</td>
</tr>
<tr>
<td>Exvessel purchases by processor type</td>
<td></td>
</tr>
<tr>
<td>Capital and labor (number of firms, employment)</td>
<td></td>
</tr>
<tr>
<td>Investment, revenue, costs, effort, efficiency, productivity</td>
<td></td>
</tr>
<tr>
<td>Markets: sales, wholesale and retail prices, number and extent, seasonality</td>
<td></td>
</tr>
<tr>
<td>Demographics, ethnic and social characteristics</td>
<td></td>
</tr>
<tr>
<td>Communities</td>
<td>Moderate to significant indirect and cumulative impacts resulting from changes in employment, recreational participation. Could result in long-term reduction in engagement. Highly dependent communities severely affected in short-term but may transition to lower levels of dependence.</td>
</tr>
<tr>
<td>Dependence on and engagement in fishing and fishing-related activities, past and present participation; aggregate of commercial, charter, private recreational and processing sectors</td>
<td></td>
</tr>
<tr>
<td>Demographics, ethnic and social characteristics</td>
<td></td>
</tr>
<tr>
<td>Social structure: networks, values, identity</td>
<td>Moderate to significant indirect and cumulative effects due to loss of fisheries-related employment and participation opportunities.</td>
</tr>
<tr>
<td>Impact on the built environment in fishing communities (including coastal infrastructure, historic and culturally important areas/structures)</td>
<td>Cumulative impact of rebuilding restrictions results in decline in fishing industry, change in character of port areas and water-dependent business.</td>
</tr>
<tr>
<td><strong>Health and Safety:</strong> weather-related vessel safety and regulation-related restrictions on access</td>
<td>Possible moderate indirect effect. Closing or restricting access to nearshore and shelf areas could change fishing patterns, expose fishermen to inclement weather if effort moves farther offshore. However, substantial reduction in total effort could reduce total exposure to hazards.</td>
</tr>
<tr>
<td>Commercial vessels</td>
<td></td>
</tr>
<tr>
<td>Charter vessels</td>
<td></td>
</tr>
<tr>
<td>Private recreational vessels and participants</td>
<td></td>
</tr>
<tr>
<td><strong>Current Management Regime</strong></td>
<td></td>
</tr>
<tr>
<td>Affected Environment</td>
<td>Potential effects of the proposed action (and whether direct, indirect or cumulative)</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Management institutions</td>
<td>Moderate direct effect if increase in management complexity, need for better monitoring, etc. Moderate to severe indirect and cumulative effects due to diversion of institutional resources to rebuilding-related activities.</td>
</tr>
<tr>
<td>Treaties and agreements</td>
<td>Negligible to moderate? If overfished stock is U.S.-Canada trans-boundary (e.g., whiting) could require more complex negotiations.</td>
</tr>
<tr>
<td>Federal laws, regulations and policies</td>
<td>Negligible direct impact. Cumulatively, a large number of overfishing declarations could lead to changes in federal fisheries law and policy.</td>
</tr>
<tr>
<td>State, local and Tribal laws, regulations and policies</td>
<td>State managed fisheries catch overfished species. To achieve rebuilding of severely depleted stocks states may need to implement new laws, policies or management measures.</td>
</tr>
<tr>
<td>Other Effects</td>
<td></td>
</tr>
<tr>
<td>Precedent for future actions with significant effects</td>
<td>Significant impact on the form and content of rebuilding plans, which may have cumulatively significant effects.</td>
</tr>
<tr>
<td>Degree of uncertainty, risk and likelihood of unknown risks</td>
<td>Procedural measures describe methods for review, revision and revocation of rebuilding plans. Costs and benefits of the tradeoff between procedurally simple methods and publicly demonstrable commitment is unknown. Unknown or unforseen events are likely in the case of species with very long rebuilding trajectories.</td>
</tr>
<tr>
<td>Degree to which the proposed action is controversial</td>
<td>These actions are very controversial.</td>
</tr>
</tbody>
</table>
2.0 PROCESS AND STANDARDS ALTERNATIVES

2.1 Description of the Alternatives

Primary purpose to set process and standards framework for rebuilding plans. There are four rebuilding issues and one housekeeping issue covered in this part (Part A) of Amendment 16:

- Issue 1: Form and Required Elements of Species Rebuilding Plans
- Issue 2: Periodic Review and Amendment of Rebuilding Plans
- Issue 3: Mandated Revisions of Harvest Strategy
- Issue 4: Rebuilding Plans for ESA Listed Species
- Issue 5: Update Language of the FMP

The language updates are provided in Appendix A, have no environmental impact and are therefore exempt from NEPA analysis under the “categorical exclusion” criteria. There will be no analyses of these changes unless unanticipated effects are raised during the public comment periods on the plan amendment. While no NEPA analysis will be conducted, options for the language updates are provided here to identify changes to an FMP approved under the authority of the Magnuson-Stevens Act.

The direct effects of the alternatives considered in Part A to Amendment 16 are on the Council process and participation in that process. There are no direct effects on the fishery, the fishery resource or environment. Exact changes to the language of the FMP that would be required to implement the options under each of the issues is provided in Appendix A.

2.1.1 Issue 1- Form and Required Elements for the Species Rebuilding Plan

The MSA requires that Councils or the Secretary take action to end overfishing and rebuild any stock that is overfished or approaching an overfished condition. The standard convention for actions taken to rebuild a stock has been termed the “rebuilding plan.”

Issue 1 of Part A to Amendment 16 covers the content that the Council will require and/or consider for inclusion in rebuilding plans. A central part of this issue is the question of what rebuilding parameters and other rebuilding plan elements will be set as part of an FMP or regulation and what related parameters and elements will be specified or explained in supporting policy documents. From the MSA and the NMFS 600 guidelines on the national standards it appears that the only specifically identified element of a rebuilding plan that must be set in the FMP or regulation is the rebuilding time (MSA 304(e)(4)(A)). However, when a stock has been overfished, FMP amendments or regulations must be established which “end overfishing and to rebuild affected stocks” (MSA Section 304(e)(3)(b)). Under the current FMP, actions required to “end overfishing and rebuild the affected stock” are generated as regulations under the annual management process, derived from the rules for specifying and managing for the OY. As specified in the National Standard Guidelines (600.310 (f)(1)), “in the case of an overfished fishery, [OY] is constrained to an amount of harvest mortality that provides for rebuilding to a level consistent with producing MSY in such fishery.” The FMP also specifies that OYs will be constrained by rebuilding needs and fishery management regulations established to meet OY. These actions therefore appear to meet that standards

While the specific element that must be placed in a fishery management plan or regulatory amendment is the target rebuilding time, there are two constraints placed on Council actions to rebuild overfished species. First remedial actions must fairly and equitable allocate restrictions and recovery benefits among the sectors (MSA 304(e)(4)(B)). This appears to be a more specific application of National Standard 6 and not a new requirement to which Councils or the Secretary must respond. Second, for fisheries governed under international agreements, the rebuilding action should reflect traditional participation by fishermen of the US relative to those of other countries (MSA 304(e)(4)(C)). None of the West Coast groundfish species are currently governed under international agreements. The groundfish species most likely to be the subject of a future international agreement is Pacific whiting. Halibut and salmon fisheries do come under international agreements and could be affected by severe needs to restrict groundfish mortality.

CFR 50 Section 600.310 (e)(4)(ii) states that “in cases where overfishing is occurring Council action must be sufficient to end overfishing.”

DRAFT GF FMP Amendment 16
Part A - Process and Standards for Rebuilding Plans

June 2002

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of Section 304(e)(3) for rebuilding actions (that actions be in FMPs or regulations). However, under Amendment 12 to the Council FMP, the Council set its rebuilding time targets during the annual specification process and did not place the time targets in the FMP or regulations. Thus the Council omitted from its FMP and regulations the single specifically identified element that is required to be part of a rebuilding action.

The issue of what a rebuilding plan must contain was not litigated with respect to West Coast rebuilding plans. However, the court has found that the Council’s previous deliberations did not consider a reasonable range of alternatives for what should be included in the rebuilding plan. In this issue a broader range of alternatives is considered including the question of whether specific fishery management measures, habitat, and bycatch measures should be included as elements of rebuilding plans.

Option Overview

Details of the options are provided in Tables 2-1a and 2-1b. This overview provides a summary of how the options are organized and additional information about how they would be implemented. Corresponding revisions to FMP amendment language are provided in Appendix A.

Under the options, elements of rebuilding plans would take one of three forms (or a combination of these forms):

**Rebuilding Plans Adopted as Policy Guidance Documents (Status Quo)** The Council will prepare rebuilding plans as stated in section 5.3.6.2 (Contents of Rebuilding Plans) of the current FMP and submit them to NMFS concurrent with its recommendations for annual management measures. Rebuilding plans themselves are not specified as regulations or FMP amendments but as statements of principles and policies. Management measures described in section 6.2 of the FMP, including automatic actions, notices, abbreviated rulemaking actions, and full rulemaking actions would be used to implement rebuilding plans.

**Rebuilding Plans Adopted as Fishery Management Plan Amendments** Amend the FMP to require elements of individual rebuilding plans for overfished species be submitted as FMP amendments. Management measures described in section 6.2 of the FMP, including automatic actions, notices, abbreviated rulemaking actions, and full rulemaking actions would be used to implement rebuilding plans.

**Rebuilding Plans Adopted as Regulatory Amendments** Amend the FMP to require elements of individual rebuilding plans to be submitted as regulatory amendments and published in the federal regulations at 50 CFR 660. Management measures described in section 6.2 of the FMP, including automatic actions, notices, abbreviated rulemaking actions, and full rulemaking actions would be used to implement rebuilding plans.

**Options**

The options are as follows.

**Option 1a.** Status Quo - Leave all elements currently listed in the FMP as part of the annual specification process—-not part of an FMP or regulation. (The court found that status quo does not meet the requirements of the MSA.

**Option 1b.** Complete Rebuilding Plan in Policy Document Accompanied by Plan Amendment to Specify T_{target} and Augment - The rebuilding plan will be developed as a single policy document that will contain within it or be accompanied by an FMP amendment to (1) implement any rebuilding actions required under Section 304(e) of the MSA that are not already authorized under the existing FMP, (2) specify in the FMP the rebuilding period required under Section 304(e)(4)(A) of the MSA (T_{target}) and (3) specify B_{neq}. Suboption (i): Specify B_{neq} as an algorithm or formula. Suboption (ii): Specify B_{neq} as a hard number. Augment the list with additional elements (see list following and Tables 2.1-a and 2.1-b).
Option 1c. Convert All Rebuilding Plan Elements into an FMP - For each overfished species incorporate into an FMP amendment all elements that the current FMP specifies as part of a rebuilding plan.

Option 1d. Convert All Rebuilding Plan Elements into a Regulatory Amendment - For each overfished species incorporate into a regulatory amendment all elements that the current FMP specifies as part of a rebuilding plan.

Option 1e. Convert All Rebuilding Plan Elements into an FMP and Augment - For each overfished species incorporate into an FMP amendment all elements that the current FMP specifies as part of a rebuilding and augment the list with additional elements (see list following and Tables 2.1-a and 2.1-b).

Option 1f. Convert All Rebuilding Plan Elements into a Regulatory Amendment and Augment - For each overfished species incorporate into a regulatory amendment all elements that the current FMP specifies as elements for a rebuilding plan and augment the list with additional elements (see following list and Tables 2.1-a and 2.1-b).

Under Options 1b, 1e or 1f one or more elements would be added as required elements for rebuilding plans. The following are the categories of elements that might be added to the required list, augmenting the rebuilding plans. Specifics of the elements that might be required under each of these categories are provided in Tables 2.1-a and 2.1-b.

A. Harvest Regulation
B. Allocation Elements
C. Bycatch Elements
D. Habitat Elements
E. Marine Reserves
F. Rebuilding Parameters
   - Biological Parameters
     - $T_{min}$: Mean Generation Time, $T_{max}$: $P_{max}$
   - Policy Parameters
     - $P_{target}$: Rebuilding Harvest Strategy

(Note: At time of final adoptions, the Council may structure an alternative that would specify some elements would be part of a policy document, some part of an FMP and some part of a regulations).

Discussion

Status quo (Option 1a) has been determined by the court to be inadequate because it does not meet the standards of the MSA, which requires certain rebuilding actions to be in the form of a plan or regulation. Under status quo, the rebuilding plan is a policy document with harvest control regulations implemented through the annual specification of regulations. The target rebuilding time is specified only in the policy document.

$B_p$

The long-term average biomass that would be expected in the absence of fishing given prevailing ecological and environmental conditions.

$T_{min}$ Mean Generation Time

A measure of the average time required for a female to produce a reproductively-active female offspring

$T_{max}$

10 years, or if $T_{max}$ is greater than 10 years then $T_{max}$ plus one mean generation time. $T_{max}$ will not be known with certainty and will be specified as the median of a range of values such that a control rule designed to achieve $T_{max}$ will have a 50% probability of reaching that objective, as determined using the best available information.

$P_{max}$

The estimated probability of reaching $T_{max}$ may not be less than 50%.

$P_{target}$ Rebuilding Harvest Strategy

The harvest control rule that will be followed to rebuild a stock in $T_{target}$ years with $P_{target}$ probability. A harvest control rule associates a given stock size (or stock size proxy) with a given level of fishing mortality and a given level of potential harvest.
Option 1b maintains the bulk of the rebuilding plan and supporting rationale in the form of a policy document while implementing the target rebuilding time as a plan amendment and fishery management actions needed to achieve the rebuilding OY as regulations. The target rebuilding time is the provision of the rebuilding plan that the MSA specifically requires be established in the form of an FMP or regulation. Under Option 1b, the MSY biomass level would also be established as part of a rebuilding plan, it could be specified as a hard number or a formula or algorithm (e.g., 50% of the most recent estimate of the biomass that would be present if there were no fishing). The MSY biomass level is not a specifically named element of a rebuilding plan that the MSA requires be established in the form of an FMP or regulation. The range of options provided here is sufficiently broad to allow the Council to include the MSY biomass level in the policy document only (not as part of an FMP or regulation) if it is determined that such status for this rebuilding parameter is sufficiently consistent with the MSA.

Options 1c and 1e would establish the entire rebuilding plan as an FMP amendment including the explanation of how the rebuilding period was determined. Options 1d and 1f would establish the entire rebuilding plan as a regulation. Options 1e and 1f would consider adding to the list of elements that are required to be part of rebuilding plans. Candidates for addition come from lists of parameters recommended for inclusion by NMFS and measures for inclusion suggested in public comment.

This issue (Issue 1) specifies only the form in which elements of the rebuilding plan will be specified, what will be required for inclusion or consideration for inclusion in the individual rebuilding plans, and, for parameters, whether they are specified as hard numbers or formula, algorithms or relational tables. It does not specify the elements or values of parameters for the individual rebuilding plans.

The choice of the form in which the rebuilding plan is specified has its main impact on the administrative burden entailed in keeping the rebuilding plan updated and the speed with which the Council and NMFS can move to update a rebuilding plan. The initial specification of the rebuilding plan for a particular species will need to be accompanied by a NEPA analysis that also meets analytical requirements of the MSA and other applicable law. The process will also need to meet NEPA, APA, MSA and other legal requirements for public notice and comment. In the initial specification, certain elements of the rebuilding plan will be incorporated into the groundfish FMP or regulations. After the initial specification, any element of the rebuilding plan or supporting rationale that is not incorporated into an FMP or regulation could be updated by the Council with advance notice to the public and an opportunity for public comment. Most recent information from stock assessments, rebuilding analyses or other scientific sources would be used to update portions of the rebuilding plan that are not incorporated into an FMP or regulation. Such changes would not require amendment to the FMP or regulations but the scientific basis for new values would have to be documented.

Whether specific provisions are in the form of a policy document, FMP or regulation does not necessarily affect how those provisions will be implemented by the Council but it may affect public expectations about how closely the Council will adhere to the provisions. FMPs and regulations are more formal than Council policy documents. The more formal the establishment of the rebuilding provisions the more public notice and comment opportunity will need to be provided.

Rebuilding parameters that are set in and FMP or regulation and established as hard numbers will be more costly to update than similar rebuilding parameters established as formulas or algorithms. The primary costs for the update are administrative in nature. Administrative costs can be measured as the direct value of the time and various expenses associated with the management process. Where administrative resources are limited, the costs can also be evaluated in terms of the lost opportunity for addressing other policy problems in the fishery. For example, the time and resources needed to amend a rebuilding plan may detract from the management systems ability to improve capacity controls in the fishery. In such an instance, the opportunity costs of the administrative action may be viewed as the difference in net benefits between the status quo capacity controls and the improved capacity controls that are delayed because of the need to modify a rebuilding plan.
2.1.2 Issue 2- Periodic Review and Rebuilding Plan Amendment

Option 2a Council Review Every 2 Years (Status Quo) Rebuilding plans will be reviewed periodically, at least every 2 years and the Council may propose revisions to existing plans at any time in accordance with the amendment process appropriate for the form of the plan (see Issue 1). Rebuilding plans will be reviewed with respect goals 1-5 defined in Section 4.5.2.1 of the FMP.

Option 2b Review Goals 2-5 Every 2 Years, Review Goal 1 Only With New Stock Assessments. Rebuilding plans will be reviewed periodically, at least every 2 years and the Council may propose revisions to existing plans at any time in accordance with the amendment process appropriate for the form of the plan (see Issue 1). Rebuilding plans will be reviewed with respect to goal 1 Section 4.5.2.1 of the rebuilding plan only when new stock assessment information is available. All other reviews will assess progress only with respect goals 2-5 defined in Section 4.5.2.1 of the FMP. Any revisions to the rebuilding plan must also be approved by NMFS.

Suboption (i) The rebuilding plan will be amended when information in the stock assessment or rebuilding analyses are updated or progress toward rebuilding has not been adequate (see Issue 3).

Suboption (ii) The rebuilding plan will be amended when new information indicates there has been a significant change in the rebuilding parameters specified in the plan or progress toward rebuilding has not been adequate (see Issue 3). The Council will consult with the SSC or GMT in determining whether a a change is significant.

Suboption (iii) The rebuilding plan will be amended when progress toward rebuilding has not been adequate (see Issue 3).

Option 2c Council Reviews Goals 2-5 Every 2 years, Schedule for Stock Assessments and Review of Rebuilding Goal 1 Set in Rebuilding Plans. Same as Option 2b except that a schedule for stock assessments will be specified in the rebuilding plan and driven by the stock dynamics (more frequent reviews and assessments will be conducted for more productive stocks). That schedule will specify an increase in the frequency of stock assessments and rebuilding plan reviews as T_{target} draws closer.

Option 2d Council Review Goals 2-5 Every 2 years, Schedule for Stock Assessments Set As Follows. Same as Option 4b except with the additional requirement that stock assessments be conducted once every 2 years when T_{max} is less than 20 years away and at least every 4 years when T_{max} is 20 years or more away.

Option 2e No Formal Council Review The Council will not conduct formal reviews. The Council may propose revisions to existing plans at any time. Any revisions to a rebuilding plan must be approved by NMFS. The Council will track harvest mortality in comparison to the harvest mortality goals under the rebuilding plan each year and will assess progress in rebuilding the stock biomass to the MSY level whenever new stock assessments are produced. Information in the Council SAFE document is expect to assist the Secretary in conducting the two year Secretarial reviews of progress under rebuilding plans. A draft of any Secretarial review will be provided to allow an opportunity for Council comment prior to the time the Secretarial review is finalized.

Suboption (i) The rebuilding plan will be amended when information in the stock assessment or rebuilding analyses are updated or progress toward rebuilding has not been adequate (see Issue 3).

12/ The goals of rebuilding programs are stated in Section 4.5.2.1 as follows: (1) achieve the population size and structure that will support the maximum sustainable yield within the specified time period; (2) minimize, to the extent practicable, the social and economic impacts associated with rebuilding, including adverse impacts on fishing communities; (3) fairly and equitably distribute both the conservation burdens (overfishing restrictions) and recovery benefits among commercial, recreational and charter fishing sectors; (4) protect the quantity and quality of habitat necessary to support the stock at healthy levels in the future; and (5) promote widespread public awareness, understanding and support for the rebuilding program.

DRAFT GF FMP Amendment 16
Part A - Process and Standards for Rebuilding Plans

June 2002

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Suboption (ii) The rebuilding plan will be amended when new information indicates there has been a significant change in the rebuilding parameters specified in the plan or progress toward rebuilding has not been adequate (see Issue 3). The Council will consult with the SSC or GMT in determining whether a change is significant.

Suboption (iii) The rebuilding plan will be amended when progress toward rebuilding has not been adequate (see Issue 3).

Options 2b, 2c, 2d, and 2e: The Council's annual SAFE document will provide (1) the most recent information available on the best estimate of total fishing mortality as compared to target fishing mortality levels pursuant to the rebuilding plan; (2) the most recent assessment of stock size compared to the expected stock size for the rebuilding trajectory; (3) information on allocation and the social and economic status of the fishery.

Discussion

Under Option 2a (status quo) rebuilding plans would undergo complete review every two years. Under Options 2b, 2c, and 2d, progress in rebuilding the stock biomass would be reviewed only when new stock assessments are available but performance of the rebuilding plans with respect to all other goals would be reviewed every two years. Under Option 2b, the frequency with which stock assessments are conducted is left open. Option 2c specifies that a schedule for conducting stock assessments would be included in each rebuilding plan and Option 2d specifies a minimum frequency for conducting stock assessments. Under Option 2e there would be no formal Council review of rebuilding plans. The Council would track progress of rebuilding stock biomass in its annual safe document and social and economic impacts of Council harvest policies would be evaluated in aggregate as part of the NEPA evaluation of the annual specification of harvest regulations. This information together with information on Council actions to protect habitat and promote public awareness of rebuilding programs would be available for incorporation into the two year review of rebuilding plans that the Secretary is required to conduct under the MSA.

Under each alternative to status quo, there are three suboptions that specify the standards for requiring an amendment to rebuilding plans. Each suboption requires amendment whenever progress is deemed inadequate, if such a standard is established under Issue 3. Additionally, under Suboption (i), an amendment to the rebuilding plan would be required with each update of rebuilding parameters in the stock assessment or rebuilding analysis. Under Suboption (ii) an amendment to the rebuilding plan would be required when there has been a significant change in the rebuilding parameters. The Council would determine significance in consultation with the GMT and SSC. Suboptions provide a minimum standard for when a plan would need to be amended and do not prevent the Council from recommending an amendment at any time.

More accurate estimates of parameters coming out of a new assessment and used in a new rebuilding analyses can dramatically change the expected probability that a stock can rebuild in the time specified in the previous rebuilding analyses. Example of the sorts of changes in rebuilding parameters that could drastically affect expected rebuilding includes both changes in biological parameters such as steepness and changes in fisheries descriptors such as selectivity. An example would include the most recent canary rockfish assessment (Methot and Piner 2002) where new information has led scientists to conclude that stock productivity (expected recruitment), as measured by the steepness parameter, was less productive than previously thought. This lowered view of productivity had the effect of increasing the time it would take to rebuild to a target even in the complete absence of removals. In addition, re-characterizing the sizes/ages typically removed by all fisheries with either new estimates of selectivity or by changing the proportion of removals allocated to different fisheries with different selectivity patterns can change the time to rebuild even though total catch remains the same. The most recent canary assessment indicates that the greater the percentage of the total catch taken by recreational fisheries relative to commercial fisheries will delay the time to rebuild because of the generally smaller size and younger ages of the recreational removals.
The choice between these options on reviewing rebuilding plans will have its primary affect on administrative burden and to a certain degree, the distribution of that burden among agencies. Under Options 2a through 2d the Council would conduct a formal annual review that may fulfill a large portion of the information required by the Secretary to fulfill the MSA requirements for formal Secretarial review every two years. Under Option 2e, information similar to what would be generated in a formal review would be available to the Council in a format that would allow the Council and the Secretary to evaluate progress and performance under the rebuilding plan but the Council would not conduct a formal review.

The choice between the suboptions specifying when a rebuilding plan would need to be amended also has its primary affect on administrative burden. Suboption i would require the most frequent amendment of rebuilding plans and Suboption iii would require the least frequent amendment. Under Suboptions ii and iii, the rebuilding plan may tend to become more outdated than under Suboption i, however, the Council would still manage based on the most recent information from stock assessments and rebuilding analyses and under all three suboptions rebuilding would not be allowed to fall further behind than the standard specified under Issue 3.

The degree of the administrative burden will be lower if rebuilding plans are largely policy documents that accompany FMP or regulatory amendments than if they are largely in the form of FMPs or regulations.

2.1.3 Issue 3- Adequacy of Progress

Option 3a No Standards for Progress (Status Quo). The current FMP has no standard for the evaluation of whether progress toward rebuilding is adequate.

Option 3b Standard Based on Negative Deviations. If an updated stock projection indicates that the stock is below the rebuilding level projected under the original rebuilding plan then progress will be considered inadequate and an adjustment to the rebuilding plan must be made. (THIS OPTION SETS VERY RIGID STANDARD AND IS BEING INCLUDED IN THIS DRAFT TO ESTABLISH A RANGE FROM NO DEVIATION IN THIS OPTION TO MAXIMUM DEVIATION IN OPTION 3c).

Option 3c Standard Based on $T_{\text{max}}$. If an updated stock projection indicates that the stock does not have at least a 50% probability of rebuilding in the maximum time ($T_{\text{max}}$), then progress will be considered inadequate and an adjustment to the rebuilding plan must be made to increase the probability of rebuilding within the maximum time to at least 50%.

Option 3d Establish a Specific Standard for Each Plan. Each rebuilding plan will be required to include a specific standard for determining when progress has been adequate.

Discussion

Currently there is no standard for evaluating the adequacy of progress under a rebuilding plan. Under Option 3b or 3c, such a standard would be established. Under Option 3b, an amendment to the rebuilding plan would be required whenever the stock falls behind the rebuilding schedule. Under Option 3c, the Council would be required to amend its rebuilding plans when the probability of rebuilding in the maximum time allowed drops below 50%. Under Option 3a there is no guidance on when a rebuilding plan would need to be modified. There would be uncertainty about the amount of deviation from a rebuilding schedule that would be allowed before an amendment to the rebuilding plan would be required. Debate over when modification is required would likely consume the time and energy of fishery managers and the public. Under Option 3d, the standard for adequacy of rebuilding would be established for each plan at the time the rebuilding plan is developed.

Eventually a determination will be required on the amount of deviation from the rebuilding schedule that will be allowed without modification of the rebuilding plan. If no deviation were allowed, all rebuilding plans would likely need to be amended with each stock assessment. Rebuilding schedules for stock recovery are averages of a wide variety of outcomes from a stochastic rebuilding model (a model that takes into account uncertainties about stock recovery response to rebuilding policies). There is a substantially higher probability that stocks will rebuild faster or slower than expected than there is that they will rebuild exactly as projected by the rebuilding schedule. In fact the probability of rebuilding exactly on the
rebuilding schedule is very low. Allowing no deviation from the rebuilding schedule is so impractical that an option that would specify a “no deviation” standard has not been included under this issue. Given that deviation from the rebuilding schedule is expected, a management system that is designed to anticipate such a contingency may be able to respond to such deviations at lower administrative costs.

Option 3b is similar to the no deviation option that was eliminated from consideration, except that it puts no limits on the degree to which rebuilding is ahead of schedule. Assuming normally distributed probabilities and unbiased stock assessments with normally distributed probabilities, rebuilding plans would likely need to be amended in half the years in which biomass is evaluated. Option 3c would allow rebuilding to fall behind schedule to the point that any further deterioration of progress would cause the rebuilding schedule to fall outside of the maximum rebuilding time allowed under the national standard guidelines. Options 3b and 3c bracket a range of other possible policies, for example, amendment of the rebuilding plan could be required when the probability of rebuilding in the maximum time falls to less than halfway between the probability of rebuilding in $T_{\text{max}}$ under the adopted rebuilding plan and a 50% probability of rebuilding within $T_{\text{max}}$ (for example, if the probability of rebuilding in $T_{\text{max}}$ under the adopted plan is 70%, then a fall in the probability of rebuilding to below 60% would require an amendment to the rebuilding plan.

The choice of whether, and if so, how far to allow the rebuilding plan to fall behind schedule before amending it is a tradeoff between the rebuilding objectives, the social and economic needs of the fishing community, and benefits of the fishery to the nation. In establishing a rebuilding plan, the Council will select a harvest policy, or harvest control rule, that determines the amount of fish to be harvested presuming a given rebuilding schedule. A determination that the rebuilding plan can be allowed to fall behind schedule so long as the probability of rebuilding in $T_{\text{max}}$ is more than 50%, says that administrative opportunity costs are sufficiently high and the short-term benefits to the community are likely to be sufficiently important that harvest levels specified in the control rule should be maintained as long as the minimum rebuilding standard is being met (the probability of rebuilding in $T_{\text{max}}$ is more than 50%). A determination that the rebuilding plan cannot be allowed to fall behind schedule at all, without a rebuilding plan amendment, is a determination that the administrative opportunity costs of frequent rebuilding plan revision are sufficiently low and potential lost opportunity from not re-evaluating the rebuilding program are likely to be sufficiently high that the program should be re-evaluated whenever it falls behind schedule. As discussed in the previous paragraph, there are options that fall between these two extremes. Option 3d would determine the measure of adequacy of rebuilding in the context of the biology and economics of each overfished species.

2.1.4 Issue 4- ESA Listed Species

Option 4a  No Special Provisions (Status Quo) There are no special provisions for rebuilding plans for species listed under the Endangered Species Act.

Option 4b  Incorporation of ESA Jeopardy Standards or Recovery Plans A jeopardy standard or recovery plan for an overfished stock listed under the ESA will supercede the rebuilding plan for the overfished species until such time as the stock is no longer listed. If a stock is delisted, the rebuilding plan will come back into effect until such time as the stock is fully rebuilt. After delisting, an amendment to the rebuilding plan may be necessary to take into account the revised status and information on the overfished stock.

Discussion

Option 4b anticipates the possibility that a groundfish species could be listed under the ESA and establishes a contingency for dealing with such an event. If an overfished stock is listed, the jeopardy standard or recovery plan for the stock would replace the rebuilding plan until the stock is delisted. This is similar to a provision in the salmon FMP under which escapement goals for a particular stock are automatically replaced by the jeopardy standard or recovery plan when a stock is listed. By including a provision for an ESA listing in the groundfish plan at this time, the Council would avoid the need to amend the plan at a later time if a groundfish species is listed under the ESA. The main impact of Option 4b is to reduce future administrative costs that would be associated with a plan amendment on the issue at a later time provide for clear interpretation of the groundfish FMP plan in the event of a listing, and facilitate quicker reaction by the Council to any requirements of a jeopardy standard or recovery plan for an
overfished stock. Under status quo, if a groundfish stock is listed, the Council may have to engage in another plan amendment process to address the listing and jeopardy standard or recovery plan, there may be some uncertainty in the management process prior to the time the plan is adjusted to address the listing.

2.1.5 Issue 5- Housekeeping Measures

The species list in section 3.1. of the FMP, Species Managed by this Fishery Management Plan, is not consistent with the groundfish species list in the annual specification and management measures (FR 67 10490; March 7, 2002) or the list at 50 CFR 660.302. The proposed measure would correct all misspellings and would specifically identify the following rockfish: chameleon (Sebastes phillipsi), dwarf-red (Sebastes rufulianus), freckled rockfish (Sebastes lentiginosus), halftbanded (Sebastes semicinctus), pinkrose (Sebastes simola), pygmy (Sebastes wilsoni), swordspine (Sebastes ensifer), widow (Sebastes entomelas), yelloweye (Sebastes ruberrimus) yellowmouth (Sebastes reedi), and yellowtail (Sebastes flavidus).

The terms "maximum fishing mortality threshold" (MFMT) and "minimum stock size threshold" (MSST) are used in the National Standard Guidelines and are intended for use as benchmarks to decide if a stock or stock complex is being overfished or is in an overfished state. The terms used to describe these same thresholds in the FMP are different from those used in the National Standard Guidelines (i.e. MFMT is the same as the F_{MSY} control rule described in the FMP and MSST is the same as the overfished/rebuilding threshold described in the FMP.) To address consistency in terminology, the equivalent terms should be defined in Sections 4.1 and 4.4 of the FMP.

The National Standard Guidelines suggest that the annual SAFE document contain a description of each stock or stock complex (50 CFR 600.315 (e)(3)). Because the MFMT and MSST are important benchmarks used to determine if overfishing has occurred or if a stock or stock complex is in an overfished state, Section 5.2 of the FMP, should call for the MFMT and MSST for stocks or stock complexes to be listed in SAFE documents. In addition, the last paragraph of Section 5.2 regarding the SAFE document availability and completion schedule is out of date and does not reflect the SAFE document schedule for 2002 and beyond.

Sections 4.2, 4.3.1, and 4.5.1 of the FMP list, summarize and/or reference the F_{MSY} proxies adopted in 1998. The 1998 values are used throughout these sections as examples in the describing F_{MSY} proxies. In spring 2000, the Council's Scientific and Statistical Committee sponsored a workshop to review the Council's groundfish exploitation rate policy. For 2001 and beyond, the Council adopted the SSC's new recommendations for harvest policies of: F40% for flatfish and whiting, F50% for rockfish (including thornyheads) and F45% for other groundfish such as sablefish and lingcod (66 FR 2338, January 11, 2001). The 1998 F_{MSY} proxy values used as examples in the FMP should be updated to reflect the Council's current policy.

References to an at-sea observer program in Sections 4.3.1.3, 4.4.2, and 4.6 indicate that no observer program exists from which data are available to upgrade stock assessments and evaluate overfishing. This text is outdated and should be updated to reflect the implementation of an at-sea observer program in 2001.

Chapter 4 contains several references to Council use of the mixed stock exception for setting QYs. These references do not comply or reference the current standards for invoking the mixed stock exception. The text needs to be updated to reflect the standards for invoking the mixed stock exception.

Chapter 5 is designated to cover the annual management process but includes numerous references to the development of rebuilding plans, which will not be on an annual cycle. Additionally, discussion of some topics is spread through numerous sections. The topic for Chapter 4 is QYs. Chapter 4 is a one page chapter in which QYs are discussed in general terms. The specific considerations and constraints that go into establishing QYs are specified in Chapter 5. A reorganization of Chapters 4 and 5 is proposed to: (1) place in Chapter 4 all considerations and constraints that go into establishing QYs, including the process and standards for establishing rebuilding plans; (2) place all provisions related to the annual
management process in Chapter 5; and (3) reorganize the sections to construct a more concise document. The proposed reorganization is documented in Appendix A.

Option 5a  **No Action Alternative** *(Do not amend FMP to include housekeeping measures.)* Leave errors and outdated information in the FMP, including misspellings, an outdated species list, outdated information on default MSY proxies and outdated information on the need for an observer program. Leave an unclear linkage between provisions of the FMP and the national standards guidelines with respect to the terms MFMT and MSMT. Leave an inaccurate description of the process for developing the safe document in the FMP. Leave sections not related to the annual process in the annual process chapter. Leave the specification of OY spread across two chapters. Leave repetitive and fragmented discussions in place.

Option 5b  **Amend FMP to include housekeeping measures** Amend FMP to include housekeeping measures to: 1) revise the list of species managed under the FMP; 2) address differences in the use of the terms maximum fishing mortality threshold (MFMT) and the minimum stock size threshold (MSST) and the National Standards Guidelines; 3) change Section 5.2 to include a description of the MFMT and MSST; 4) update last paragraph of Section 5.2 regarding the SAFE document availability and completion schedule; 5) update Sections 4.2, 4.3.1, and 4.5.1 of the FMP to include the Council adopted the SSC's new recommendations for harvest policies of: F40% for flatfish and whiting, F50% for rockfish (including thornyheads) and F45% for other groundfish such as sablefish and lingcod; 6) update the references to an at-sea observer program in sections 4.3.1.3, 4.4.2 and 4.6; and 7) reorganize Chapters 4 and 5 to produce a more concise document.

2.2  **Council-recommended Alternatives**
### Table 2.1-a. Issue 1, option details

<table>
<thead>
<tr>
<th>Status Quo</th>
<th>Option 1a</th>
<th>Option 1b</th>
<th>Option 1c</th>
<th>Option 1d</th>
<th>Option 1e</th>
<th>Option 1f</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Policy Doc</td>
<td>Complete</td>
<td>&amp; Augment</td>
<td>Convert All</td>
<td>Convert All</td>
<td>Convert All</td>
</tr>
<tr>
<td></td>
<td>Rbld Pln in FMP</td>
<td>Rbld Pln in FMP</td>
<td>T_{target}</td>
<td>B_{max} to FMP</td>
<td>Elements to Regulatory Amendmnt</td>
<td>Elements to Regulatory Amendmnt</td>
</tr>
</tbody>
</table>

#### Elements in the Current FMP

The second paragraph of Section 5.3.6.2 states that rebuilding plans will specify any individual goals and objectives including:

- a time period for ending the overfished condition and rebuilding the stock $[T_{target}]$;

- and the target biomass to be achieved $[B_{max}]$ (biological parameter)

**Suboption:** specify as a formula or algorithm.
- Option i = Yes; Option ii = No (specify as a hard number)

explain how the rebuilding period was determined, including any calculations that demonstrate the scientific validity of the rebuilding period;

identify potential or likely allocations among sectors;

identify the types of management measures that will likely be imposed to ensure rebuilding in the specified period;

provide other information that may be useful to achieve the goals and objectives.
Table 2.1-a. Issue 1, option details.

<table>
<thead>
<tr>
<th></th>
<th>Option 1a Status Quo</th>
<th>Option 1b Complete Rbd Pix in Policy Doc Accompl by FMP Amend for $T_{target}$ &amp; $B_{new}$, &amp; Augment</th>
<th>Option 1c Convert All Elements to FMP Amendment</th>
<th>Option 1d Convert All Elements to Regulatory Amendment &amp; Augment</th>
<th>Option 1e Convert All Elements to Plan Amendment &amp; Augment</th>
<th>Option 1f Convert All Elements to Regulatory Amendment &amp; Augment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements to Consider Adding to Rebuilding Plans</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>F</td>
<td>R</td>
</tr>
<tr>
<td>Harvest Regulations. Include specific harvest control measures (regulations) as part of the rebuilding plan (if in the form of an FMP amendment the rebuilding plan would also need to amend regulations). NOTE: Under other Options 1a-1d specific harvest regulations are established in conjunction with the annual process for setting OY.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>F</td>
<td>R</td>
</tr>
<tr>
<td>Allocation. Include allocations or allocation priorities for overfished species where specific allocations or allocation priorities have not already been specified under the procedures of the FMP or in the FMP. NOTE: Under other Options 1a-1d specific allocations are specified under existing FMP provisions or the allocation framework and implemented in conjunction with the annual process for setting OY.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>F</td>
<td>R</td>
</tr>
<tr>
<td>Bycatch. Suboption (i) Include consideration of the adequacy of information on bycatch and bycatch mortality. Measures needed to acquire the bycatch information necessary to adequately implement the harvest control rule may be considered as part of the rebuilding plan or in a separate plan or regulatory amendment. Adopt risk averse harvest levels sufficient to account for uncertainty about bycatch.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>R</td>
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</table>

(Note: Bycatch measures will also be addressed as part of Amendment XX)

Suboption (ii) Include such measures as are needed

• to acquire the bycatch information necessary to adequately implement the harvest control rule.

• to minimize bycatch and minimize the mortality of unavoidable bycatch as part of the rebuilding plans.

(Note: Bycatch measures will also be addressed as part of Amendment XX)

Habitat. Include specific habitat protection measures.

X                     | X                                                                                               | X                                               | X                                                            | F                                                             | R                                                             |

Close Areas. Include consideration of the contribution areas closed to groundfish fishing might make to rebuilding the stock (closed areas could range in extent to restricting all fishing, i.e. no-take marine reserves). Include such measures in the plan as appropriate.

X                     | X                                                                                               | X                                               | X                                                            | F                                                             | R                                                             |
| Parameters. The list of candidate parameters and the form in which they would be expressed “hard values” or “algorithms or formulae” is provided in Table 2.1-b. (NOTE: All parameters need not be added in the same form, i.e. some can be expressed as “hard values” others as “algorithms or formulae”. Additionally, not all parameters may need be placed in the same type of document. It may be possible to specify that some will be placed in a policy document and others in the FMP or regulation. | X | P | X | X | F | R |
### Table 2.1-b. Issue 1 suboptions for adding to the list of required parameters.

**Parameters to be Added As Part of the Rebuilding Action—(Suboptions)**

For Option 1b the action is to add the element in a policy document.
For Option 1e the action is to add the element in a n FMP amendment,
For Option 1f the action is to add the element in a a regulatory amendment.

*(NOTE: \( B_{max} \) and \( T_{large} \) are included in Table 2-1 as elements required in the current FMP. They are included as part of the status quo and no proposal is being made to remove these values from the list of required parameters.)*

<table>
<thead>
<tr>
<th>Suboptions</th>
<th>(i)</th>
<th>(ii)</th>
<th>(iii)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameters Set As Part of the Rebuilding Action</strong></td>
<td>(Based on NMFS letter of 4/5/02)</td>
<td>(Based on SSC Comments, April 2002)</td>
<td>(Add all Parameters with Maximum Flexibility)</td>
</tr>
<tr>
<td><strong>Parameter Set as a &quot;Hard Value&quot;</strong></td>
<td>( T_{min} )</td>
<td>( T_{max} )</td>
<td>Mean Generation Time</td>
</tr>
<tr>
<td><strong>Parameters Set as a Formula, Algorithm, or Table</strong></td>
<td>( P_{target} )</td>
<td>( T_{min} )</td>
<td>( T_{max} )</td>
</tr>
<tr>
<td><strong>Rebuilding Harvest Strategy</strong></td>
<td>( e.g. )</td>
<td>( Constant Catch )</td>
<td>( Mean Gen Time )</td>
</tr>
<tr>
<td><strong>Constant EI combination</strong></td>
<td>( h/ )</td>
<td>( Rbldg Hrvst Strat )</td>
<td></td>
</tr>
<tr>
<td><strong>Form of Parameter Determined on Species by Species Basis</strong></td>
<td>( P_{target} )</td>
<td>( B_{0} )</td>
<td>MSY or proxy</td>
</tr>
<tr>
<td><strong>Parameters to be Discussed in Supporting Rationale for Rebuilding Action</strong></td>
<td>Not Included as Part of the Rebuilding Action (not included as part of the FMP or regulation)</td>
<td>T_{min} T_{max} MSY or proxy</td>
<td>( Rbldg Hrvst Strat )</td>
</tr>
<tr>
<td><strong>Parameter Identified as a &quot;Hard Value&quot;</strong></td>
<td>( P_{max} )</td>
<td>Current forecast of the rebuilding trajectory.</td>
<td></td>
</tr>
<tr>
<td><strong>Parameters Identified as a Formula, Algorithm or Table</strong></td>
<td>( P_{max} )</td>
<td>Current forecast of the rebuilding trajectory.</td>
<td></td>
</tr>
<tr>
<td><strong>Form of Parameter Determined on Species by Species Basis</strong></td>
<td>( B_{0} )</td>
<td>MSY or proxy</td>
<td></td>
</tr>
<tr>
<td><strong>Parameters not included</strong></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

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DRAFT GF FMP Amendment 16
Part A - Process and Standards for Rebuilding Plans

June 2002
3.0 AFFECTED ENVIRONMENT

3.1 Biological Environment

The process and standards measures considered in this Part are not anticipated to directly affect marine species or ecosystems. The rebuilding plans do have substantial direct and indirect effects, and taken together these actions may have significant cumulative impacts. This section provides a broad overview of the natural and socioeconomic environment. The management process is also described because the proposed action in this Part will more likely affect it. More detailed descriptions of overfished species may be found in the rebuilding plan sections of this amendment.

3.1.1 Overfished Groundfish Species or Stocks

Bocaccio (Sebastes paucispinis) was declared overfished in 1999. There are two separate West Coast populations, divided in the vicinity of Cape Mendocino, California. The southern bocaccio stock extends from about Cape Mendocino south as far as Sacramento Reef, Baja California. Bocaccio inhabit depths between 50 and 300 m but most commonly occur on the outer continental shelf at depths are 100 to 150 m. Larvae and small juveniles are pelagic and most often found in shallow coastal waters over rocky bottoms associated with algae. Large juveniles and adults are semi-demersal. Newly settled larvae in central California are first observed associated with the giant kelp canopy, but are also seen throughout the water column. Adults are commonly found in eelgrass beds, or congregated around floating kelp beds. Large adults disappear from traditional commercial fishing grounds during winter spawning and reappear in the spring. Parturition (birthing) occurs during November to March off northern and central California, and October to March off southern California. Male bocaccio mature at 3 to 7 years and females mature at 3 to 8 years. Adult bocaccio eat small fishes associated with kelp beds, including other species of rockfishes, and occasionally small amounts of shellfish. They are in turn prey for sharks, salmon, other rockfishes, lingcod and albacore; sea lions, porpoises, and whales also feed on them. This species directly competes with chilipepper, widow, yellowtail, and shortbelly rockfishes for both food and habitat resources.

Canary Rockfish (Sebastes pinniger) were declared overfished in 2000. They commonly inhabit oceanic waters in depths from 91 to 274 m. Historically, this species was fairly abundant throughout its range. Canary rockfish occur from northern Baja California (Mexico), to the western Gulf of Alaska. Adult canary rockfish are primarily restricted along the continental shelf from 457 m, inshore to 46 m. Adults feed on small crustaceans as well as anchovies, sand dabs, and other small fishes. The canary rockfish, like all members of the genus Sebastes, produces live young. Female canary rockfish reach sexual maturity at roughly 8 years of age. Canary rockfish off the Pacific Coast have a long spawning period from September through March, probably peaking in December and January off Washington and Oregon. Upon release from the female, larvae are planktonic in the upper 100 m of the water column. Although little is known about the early life history strategies of this rockfish, they are thought to migrate to demersal (bottom) waters during the summer of their first year, and develop into juveniles around nearshore rock reefs, where they may congregate for up to three years. They tend to move to deeper waters as they age. Females generally grow faster and reach slightly larger sizes than males, but it appears males generally live considerably longer than females. Both sexes are capable of reaching nearly 70 years of age, but very few females older than 30 years have been observed Washington and Oregon sample data.

Cowcod (Sebastes levis) was declared overfished in 2000. It is one of the largest West Coast rockfish and feeds mainly fishes, octopus, and squid. Juvenile cowcod eat small shrimp and crabs. New age and growth data reveal that cowcod are long-lived, slow growing, and become sexually mature at the relatively old age of 12 years. Their maximum age is estimated to be 75 years. Females give birth to planktonic larvae during the winter, which are free-floating and may be found in shallower water. However, as they grow larger they move to deep water rocky environment. Adults are usually associated with rocky bottoms, particularly where there are sharp, steep drop-offs. They typically inhabit the continental slope and upper continental shelf, from about 150 to 350 m. Larvae and juveniles are planktonic for up to 3 months and are likely to disperse long distances before settling to the bottom.

Darkblotted Rockfish (Sebastes cromer) were declared overfished in 2001. This species’ range extends from the Bering Sea to near Santa Catalina Island, California, on soft bottom at 29 to 549 m, but usually deeper than 76 m. The population off Washington, Oregon and California is considered a single stock. Darkblotted rockfish migrate to deeper waters with increasing size and age, and males are generally
smaller than females at age and in the fishery. Darkblotted rockfish are caught almost entirely with commercial trawl gear as part of a complex of slope rockfish that includes Pacific ocean perch, splitnose rockfish, yellowmouth rockfish, and sharpchin rockfish.

Lingcod (*Ophiodon elongatus*) were declared overfished in 1999. They are top-order predators of the family Hexagrammidae. The species ranges from Baja California to Kodiak Island in the Gulf of Alaska, and its center of abundance is near British Columbia and Washington. The West Coast portion of the species' range is considered to be one continuous population that extends into British Columbia. Lingcod are demersal on the continental shelf, most abundant in waters less than 200 meters deep, and distributed in patches among areas of hard bottom and rocky relief. This species generally does not migrate, although some tagged individuals have moved exceptional distances, and indirect evidence suggests a seasonal onshore movement associated with spawning. According to fishery and survey data males tend to be more abundant than females in shallow water, and the size of both sexes increases with depth. Females are usually larger than males, reaching a mature length of 76 cm at three years old or later. Males, in contrast, mature faster and at a smaller size: about two years and 50 cm. Maximum age is about 20 years.

Pacific Ocean Perch (POP) (*Sebastes alutus*) were declared overfished in 1999. They inhabit the continental slope from Japan and the Bering Sea to southern California. The West Coast stock extends from the U.S.-Canada border to northern California. POP primarily inhabit waters of the upper continental slope and are found along the edge of the continental shelf, ranging as deep as 825 m but usually found at 100 to 450 m. Throughout its range, the species is generally associated with gravel, rocky or boulder type substrates found in and along gullies, canyons, and submarine depressions of the upper continental slope. POP winter and spawn in deeper water (>275 m), then move to feeding grounds in shallow water (180 to 220 m) in the summer (June through August) to allow gonads to ripen. They release their larvae in depths of 360 to 400 m and juveniles stay in shallow water over rough or rocky bottoms, sometimes forming ball-shaped schools near the surface. Adults form large schools 30 m wide, to 80 m deep, and as much as 1,300 m long. Largest size is about 54 cm and 2 kg and their maximum age has been estimated at about 90 years.

Pacific whiting (*Merluccius productus*), also known as hake, were declared overfished in 2002. They are a semi-pelagic roundfish distributed from the Gulf of California to the Gulf of Alaska and east to Asia in depths from 0 to 1000 m (usually in depths <250 m). There are genetic differences between the West Coast whiting population and those found in the larger, semi-enclosed inlets of Puget Sound and the Strait of Georgia; the southern stock off Baja California also differs. The coastal Pacific whiting stock ranges from southern California to Queen Charlotte Sound but only the main coastal population off the Pacific Coast waters of WOC are within Council purview. Spawning occurs off southern California from January to March; the stock then migrates northward to feed in the waters off the continental slope and shelf from northern California to Vancouver Island.

Widow Rockfish (*Sebastes entomelas*) were declared overfished in 2001. These species ranges from southeastern Alaska to northern Baja California, where it frequents rocky banks at depths of 25 to 370 m. In those habitats it feeds on small pelagic crustaceans and fishes. There is no evidence that separate genetic stocks of widow rockfish occur along the Pacific Coast. Female widow rockfish attain a larger size compared to males, and fish in the northern part of the range tend to be larger at age compared to those in the south. Aggregations of this species form at night and disperse at dawn, an atypical pattern for rockfish. Widow rockfish is an important commercial groundfish species

Yelloweye Rockfish (*Sebastes ruberrimus*) were declared overfished in 2002. Yelloweye are distributed along the West Coast from Ensenada, Baja California to the Gulf of Alaska in high relief, rocky habitats at depths between 15 and 550 m. They are large-sized (up to 91 cm), long-lived (up to 118 years), late maturing, and relatively sedentary rockfish. These life history traits make yelloweye particularly susceptible to overfishing. Although they do tend to have a high fidelity to particular areas with little evidence of migration, there is no evidence of genetic stock structure throughout their range. Yelloweye have a varied diet of forage fish, other rockfishes, crustaceans, and have been known to eat lingcod spawn. This species is highly prized in both commercial and recreational fisheries due to their large size and fillet quality, and are readily taken with line gear. They are much less common in bottom trawl catches, which have been further reduced with the small footrope restrictions put in place on the shelf since 2000. Decompression and temperature shock account for high rates of yelloweye mortality.
3.1.2 Other Management Unit Species

The Pacific Coast Groundfish FMP manages over 80 species, including the overfished species described above. Although the majority of these species are rockfish (members of the genus *Sebastes*), flatfish and other roundfish are also part of the management unit. Information on the interactions between the various groundfish species and between groundfish and non-groundfish species varies. While a few species have been intensely studied, there is relatively little information on most. Fewer than 20 of the groundfish species have ever been comprehensively assessed. Only Pacific whiting has been assessed annually.

Since 2000, rockfish species managed under the FMP have been divided into six groups based on habitat (nearshore, shelf, and slope) and latitude (north or south of 40° 10' N latitude). The three northern groups encompass the preexisting U.S./Vancouver, Columbia, and Eureka management areas while the southern groups cover the Monterey and Conception management areas. Rockfish are further divided into those species or stocks that are individually and more rigorously assessed so that stock-specific ABCs and OYs can be developed and less rigorously assessed groups, which usually are also less commonly caught by managed fisheries. The Council employs a precautionary policy for the less rigorously assessed species, which are termed "minor rockfish." The policy assumes that fishing mortality accounts for 75% of total mortality (with natural causes accounting for the remaining quarter). As an added precaution, the OYs for these stocks are set at 75% of ABCs. For species with no stock assessments, where ABCs and OYs are based on historic fisheries landings levels, the Council is even more cautious, setting the OYs at 50% of ABCs.

Aside from rockfish and whiting, Dover sole and sablefish are important commercial species. Sole are mainly caught in a deepwater trawl fishery off of Oregon and Washington as part of the "DTS complex," a shorthand for the main constituents of the catch: Dover sole, thornyheads and sablefish. Thornyheads are also considered rockfish, but in the genus *Sebastolabus.* Arrowtooth flounder, English sole and petrale sole are other commercially important flatfish, caught mainly in this fishery, whose stocks have been assessed. In addition to their commercial importance, Dover sole, sablefish and shortspine thornyhead are considered in the "precautionary zone." This refers to the Council's management policy that sets a biomass target that is a proxy for MSY. If stock size is below this level, but not overfished, it is in the precautionary zone and the "40-10 harvest rate policy" adjustment is applied. These three species are briefly described below.

**Dover sole** (*Microstomus pacificus*) is a deep water flatfish that ranges from northern Baja California to the Bering Sea and inhabits depths up to 1500 m. Their extended pelagic larval phase can last for more than a year. This results in extensive larval dispersal because of the influence of Pacific Coast currents during this period. Recruitment is probably correlated to variation in current patterns and ocean regime shifts. Adults are relatively sedentary with no evidence of extensive latitudinal movements. They do, however, make seasonal migrations from the continental slope to the shelf in the spring and back to the slope in the fall to spawn. Dover sole are only harvested by trawl gear.

**Sablefish** (*Anoplopoma fimbria*), also known as blackcod, are a deep water roundfish highly prized in commercial markets for their taste and oil content. They range from southern Baja California to the central Bering Sea, west to Kamchatka and south to Hokkaido, Japan in depths usually from 275 to 900 m, but they have been found deeper 2,000 m. Eggs and larvae are pelagic. They spawn in the winter months in deep water off the continental slope. Sablefish are highly migratory; tagging studies have documented migrations of up to 2,700 miles. There are at least three genetically distinct populations on 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. The stock between California and Washington is actively assessed and managed through the Pacific Council.

**Shortspine thornyhead** (*Sebastolobus alascanus*) is a major component of the deepwater fishery on the continental slope, especially in the DTS trawl fishery. They are widely distributed from northern Baja California to the Bering Sea at depths of 100 to 1600 m. The status of this stock is subject to substantial public debate. Although it is one of the most numerous components of the slope ecosystem, because of its long life and slow growth it cannot sustain aggregate harvest rates. It is taken coincidentally with Dover sole, sablefish, and longspine thornyhead, especially in the upper slope and lower shelf; in deeper water, longspine thornyhead is a more predominate species. The two thornyhead species are often
difficult to distinguish, and historical landings data combine the two into a single category. Shortspine thornyhead is a "constraining species" in the deepwater fishery; that is, coincidental catch of this species prevents full harvest of Dover sole and sablefish.

3.1.3 Incidentally Caught Species Outside the Management Unit

Groundfish fisheries catch a range of species not managed under the Groundfish FMP, although they may be managed under one of the Council’s other three FMPs. Similarly, fisheries targeting species outside the management unit catch groundfish incidentally. The principal species in these categories are discussed briefly here.

Coastal pelagic species (CPS) are managed under the Council’s CPS FMP. They are schooling fish, not associated with the ocean bottom, that migrate in coastal waters. These species include: northern anchovy (Engraulis mordax), Pacific sardine (Sardinops sagax), Pacific (chub) mackerel (Scomber japonicus), jack mackerel (Trachurus symmetricus) and market squid (Decapoda). CPS are taken incidentally in the at-sea and shore-based whiting fishery. There is little information on the incidental take of CPS by the other segments of the fishery. However, since CPS are not associated with the ocean bottom, the interaction is expected to be minimal.

Dungeness crab (Cancer magister)—typically harvested using traps (crab pots), ring nets, by hand (scuba divers) or dip nets—are incidentally taken or harmed unintentionally by groundfish gears. Distributed from the Aleutian Islands, Alaska, to Monterey Bay, California, this crab lives in bays, inlets, around estuaries, and on the continental shelf. They are managed by the states of Oregon and California, and by the State of Washington in cooperation with Washington Coast treaty tribes.

Pacific pink shrimp (Pandalus jordani) targeted by shrimp trawlers, commonly take associated groundfish. This species is found from Unalaska in the Aleutian Islands to San Diego, California, at depths of 46 to 366 m. However, the fishery is occurs along the U.S. West Coast from northern Washington to central California, and is concentrated off of Oregon. Shrimp trawl nets are usually constructed with net mesh sizes smaller than the net mesh sizes for legal groundfish trawl gear. Pacific shrimp fisheries are state-managed rather than by the Council.

Pacific halibut (Hippoglossus stenolepis) can be found along the continental shelf in the North Pacific and Bering Sea. They have flat, diamond-shaped bodies and are able to migrate long distances. Most adult fish tend to remain on the same grounds year after year, making only a seasonal migrations from the more shallow feeding grounds in summer to deeper spawning grounds in winter. Halibut are usually found in deep water (40 to 200 m). The International Pacific Halibut Commission (IPHC) estimates that the 2002 mortality level of legal-sized halibut incidentally taken in shrimp and groundfish trawl fisheries will be 254 mt (560,000 pounds). Pacific halibut are managed by the bilateral (U.S./Canada) IPHC, with Area 2A implementation of IPHC catch levels and regulations being the responsibility of the Council, the states of WOC, and the Pacific halibut treaty tribes.

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 their lives in the open ocean where they may be incidentally taken by groundfish gears, particularly in trawls. Preliminary data from the 2001 at-sea whiting fishery indicates the fishery encounters very minor amounts of forage fish species. (Less than 5 mt Pacific herring and 1 mt of smelt and sardines combined were caught). 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.

Little information is available on non-groundfish species incidentally captured in the groundfish fishery. In addition to those species mentioned above, known incidental catch in the whiting fishery includes American shad and walleye pollock. 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). Preliminary data indicate approximately 112 mt were taken as incidental catch in the at-sea sector of the Pacific whiting fishery in 2001, through October. 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. Preliminary data indicates approximately 280 mt were taken as incidental catch in the at-sea sector of the Pacific Whiting fishery in 2001, through October.

3.1.3 Habitat Including Essential Fish Habitat (EFH)

3.1.3.1 Coast Wide Marine Habitat Characteristics

In the North Pacific Ocean, the large, clockwise-moving North Pacific Gyre circulates cold, sub-arctic surface water eastward splitting at the North American continent into the northward-moving Alaska Current and the southward-moving California Current. The California Current, a surface current, flows southward along the U.S. west coast and through the U.S. 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, 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, andsquirts. 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, and Simpson 1987) and through larger-scale climate variation, such as El Niño-La Niña or Pacific Decadal Oscillation (Longhurst, 1998).

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.

3.1.3.2 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 disperse 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 upper 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 scars 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 species managed under the FMP are described in the EFH appendix to Amendment 11, which is available online at http://www.nwr.noaa.gov/1sustfish/efhappendix/page1.html.

3.1.4 Biodiversity and Ecosystem Function

3.1.5 Protected Species

Protected species fall under three overlapping categories. First are marine mammals protected under the Marine Mammal Protection Act (MMPA) of 1972. The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and on the importing of marine mammals and marine mammal products into the United States. Under the MMPA NMFS manages West Coast cetaceans and pinnipeds, while the U.S. Fish and Wildlife Service (FWS) manages sea otters. Stock assessments report new information every year for strategic stocks and every three years for non-strategic stocks. Strategic stocks are defined as those whose human-caused mortality and injury exceeds the potential biological removal. Marine mammals whose abundance falls below the optimum sustainable population 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.

Second, species may be given protection under the Endangered Species Act (ESA) of 1973. The ESA protects species in danger of extinction throughout all or a significant part of their range and mandates the
conservation of the ecosystems on which they depend. "Species" is defined by the Act to mean a species, a subspecies, or—for vertebrates only—a distinct population. Under the ESA, a species is listed as "endangered" if it is in danger of extinction throughout a significant portion of its range and "threatened" if it is likely to become an endangered species within the foreseeable future throughout all, or a significant part of, its range. (As noted in Table 2-1, three marine mammal stocks are also listed under the Endangered Species Act.)

Third, the Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful. In addition to the MBTA, an Executive Order, Responsibilities of Federal Agencies to Protect Migratory Birds, (E.O. 13186) directs federal agencies to protect migratory birds from harm.

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### Marine Mammals

|------------|---------------------------------------------------------------------------------------------------------------|

### Seabirds

|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|

<table>
<thead>
<tr>
<th>Threatened</th>
<th>Marbled murrelet (<em>Brachyramphs marmoratus</em>)</th>
</tr>
</thead>
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### Se Turtles

| Endangered | Green turtle (*Chelonia mydas*)  
Leatherback turtle (*Dermochelys coriacea*)  
Olive ridley turtle (*Lepidochelys olivacea*) |
|------------|------------------------------------------------------------------------------------------|

<table>
<thead>
<tr>
<th>Threatened</th>
<th>Loggerhead turtle (<em>Caretta caretta</em>)</th>
</tr>
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</table>

### 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 |
|------------|------------------------------------------------------------------------------------------|

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Table 2-1: ESA-listed species occurring in West Coast waters.
agencies to negotiate Memoranda of Understanding with the U.S. Fish and Wildlife Service that would obligate agencies to evaluate the impact on migratory birds as part of any NEPA process. NOAA is also preparing an National Plan of Action to Reduce the Incidental Take of Seabirds in Longline Fisheries. This document contains guidelines that are applicable to relevant groundfish fisheries and would require seabird incidental catch mitigation if a significant problem is found to exist. The FWS is the primary federal agency responsible for seabird conservation and management. Under the MSA, NMFS must ensure fishery management actions comply with other laws designed to protect seabirds. NMFS is also required to consult with FWS if fishery management plan actions may affect seabird species listed as endangered or threatened. Taken together, these laws and directives underscore the need to consider impacts to seabirds in decision making and consider ways to reduce potential impacts of the proposed action. Four bird species are also ESA-listed, as noted in Table 2-1.

3.1.5.1 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.

Under the ESA, threatened species occurring off the West Coast include:
- Steller sea lion (Eumetopias jubatus) Eastern Stock,
- Guadalupe fur seal (Arctocephalus townsendi), and
- Southern sea otter (Enhydra lutris) California Stock.

Under the MMPA, depleted species occurring off the West Coast include:
- Sperm whale (Physeter macrocephalus) WOC Stock,
- Humpback whale (Megaptera novaeangliae) WOC - Mexico Stock,
- Blue whale (Balaenoptera musculus) Eastern North Pacific Stock, and
- Fin whale (Balaenoptera physalus) WOC Stock.

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 optimum sustainable population 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 optimum sustainable population. 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.

3.1.5.2 ESA-Listed Species

In addition to marine mammals (described above), a range of West Coast marine species are listed as endangered or threatened under the Endangered Species Act.

Sea turtles are highly migratory; four of the six species found in U.S. waters have been sighted off the West Coast. The green turtle (Chelonia mydas), the leatherback turtle (Dermochelys coriacea), and the olive ridley turtle (Lepidochelys olivacea) are listed as endangered, and the loggerhead turtle (Caretta caretta) is listed as threatened. The management and conservation of sea turtles is shared between NMFS and FWS. 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.

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 significant, 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).

3.1.5.2 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, kitiwakes, skimmers, terns, guillemots, murrelets, aukslets, and penguins. 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 widespread 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 areas.
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.

3.2 Socioeconomic Environment

3.2.1 FMP Fisheries Overall

The Pacific Coast commercial groundfish fishery is a year round, multi-species fishery that takes place off the coasts of WOC. Most of the commercial groundfish harvest is taken by trawl, longline, and trap (or pot) vessels operating in the limited entry segment of the groundfish fishery. The limited entry program was established in 1994. All vessels that land groundfish without groundfish limited entry permits are classified as open access vessels. Several open access fisheries take groundfish incidentally or in small amounts; participants in those fisheries may use, with some restrictions, longline, vertical hook-and-line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, sea cucumber trawl, and other gears.

In 1996 groundfish comprised over 20% of the exvessel value of all marine and anadromous fish landed on West Coast landings receipts. Exvessel value of groundfish landings in that year were up 17% as compared to 1986. By 2000, the exvessel value of groundfish landings had fallen 28% from the 1996 level (from $85.0 million to $61.3 million) and was 15% below the 1986 exvessel value. As a whole, exvessel value of West Coast landings dropped 24% between 1986 and 2000. (Note: these values are adjusted for inflation and do not include at-sea whiting deliveries.)

By value, West Coast landings tend to peak in the winter and late summer months. The height of the summer peak is largely influenced by the fixed gear sablefish fishery. In 1986 the groundfish fishery tended to occur at a more even rate on a year round basis. Landings by limited entry vessels comprise a large portion of the total groundfish landings.

Of the 231 vessels participating in the limited entry trawl fishery in 2000 all but nine earned more than 5% of their revenue from groundfish. In the same year most trawl vessels (85%) landed in excess of $100,000 (exvessel value) and about two-thirds depended on groundfish for at least 65% of their gross revenue.

There were 172 vessels that participated only in the limited entry fixed gear fishery in 2000 and all but 12 got more than 5% of their revenue from groundfish. But of those earning more than $100,000, less than a third (78%) depended on groundfish for more than 65% of their gross revenue. This suggests that larger producing non-trawl vessels tend to be less dependent on groundfish than trawl vessels.

The open access fishery is the largest sector, with 1,413 vessels in 2001, and as a group they are the least dependent on groundfish. Using the same measure, only 56% got more than 5% of their revenue from groundfish. The 141 larger vessels (more than $100,000 in exvessel revenue) in this sector were much less dependent on groundfish in comparison to the other two sectors: all but one of the vessels earned less than 35% of their gross revenue from groundfish.

Groundfish are taken as bycatch in several other fisheries, which are generally included in the groundfish open access sector for the purposes of management. The salmon and shrimp fisheries are the two most important. The commercial salmon fleet has been on a declining trend in recent years. However, since 1999 landings have improved because of greater salmon abundance, resulting in substantial increases in total and average revenue per vessel. The open access share of groundfish north of Cape Mendocino was based primarily on historical groundfish catch in the pink shrimp fishery. In 1981, the three coastal states established uniform coast wide regulations for the fishery, which all vessels must abide by regardless of their permit status. The season runs from April 1 through October 31 and commercial vessels may only use trawl nets or pots. Most of the pink shrimp catch is taken by trawl gear, which must have a minimum mesh size of 1-3/8 inches between knots.

3.2.2 Commercial Sector
3.2.3 Recreational Sector

Recreational fishing has been part of the culture and economy of West Coast fishing communities for more than 50 years. Along the northern coast, most recreational fishing targets salmon; in the past, abundant rockfish often provided a bonus to anglers. Recreational fisheries have contributed substantially to fishing communities, bringing in outside dollars and contributing to tourism in general.

Recreational fishing in the open ocean appears to have been on a downward trend for a number of years, but seems to have increased in the year 2000. Part of this decline is likely the result of shorter salmon seasons and smaller bag (retention) limits. Some effort shift from salmon to groundfish likely occurred. Groundfish are taken as target catch and as incidental catch in fisheries targeting other species. The degree to which the opportunity to harvest groundfish contributes to incentive for non-groundfish trips is uncertain. However, there is likely some relationship to the frequency of groundfish catch on the trip. More recreational trips are taken in southern California than in northern California, Oregon, or Washington. The distribution of recreational charter vessels coincides with the geographic distribution of trips.

3.2.4 Buyers and Processors

Several thousand entities have permits to buy fish on the West Coast. Of these, 1,780\textsuperscript{13} 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.\textsuperscript{14} This group can be narrowed further because larger buyers (more than $20,000 in purchases) tend to handle groundfish more than smaller buyers. This group of 546 buyers bought 99\% of all Council managed groundfish. But even this group can be narrowed since only 59\% actually bought groundfish. Although a larger group, only a third of smaller buyers (less than $20,000 in purchases) bought groundfish.

Of the 732 buyers identified above, a small proportion (17\%) purchased from trawl vessels. But this group is also important to non-trawl vessels, buying 60\% (by value) of their landed catch. These buyers also tend to be the largest: 28 of 38 buyers with purchases over $1 million bought from trawl vessels and they made 78\% of all groundfish purchases from trawl vessels. Mid-size buyers ($20,000-$1 million in purchases), on the other hand, are more important to non-trawl vessels, buying half of all fish off these vessels. However, the larger buyers tend to have more of a year round presence; four-fifths bought groundfish in every month in 2000 while slightly less than a third of those not purchasing groundfish bought in every month. If not active year round, buyers are most often inactive in the winter months (November to March).

In most port areas on the West Coast there are generally six or fewer buyers purchasing from limited entry vessels. In the north, the primary exception is Astoria, and in the south, the exceptions are San Francisco, Monterey, and San Luis Obispo. In San Francisco and south of San Luis Obispo more buyers purchase groundfish from non-trawl vessels (fixed gear catching rockfish and other groundfish) in comparison to buyers of trawl-caught species.

3.2.5 Communities

Fishing communities, as defined in the MSA, include not only the people who actually catch the fish, but also those involved in fisheries-dependent services and industries. In commercial fishing this may include boatyards, fish handlers, processors, and ice suppliers. In recreational fishing this may include tackle shops, small marinas, lodging facilities catering to out-of-town anglers, and tourism bureaus advertising charter fishing opportunities. People employed in fishery management and enforcement are also considered part of fishing communities.

\textsuperscript{13} For this analysis a "buyer" was defined as a unique combination of PacFIN port code and state buyer code on the fish ticket. For California, a single company may have several buying codes that vary only by the last two digits. The last two digits on these codes were truncated and would appear as separate buying units only if they appear on fish tickets for different ports.

\textsuperscript{14} Unless otherwise noted, this section provides quantitative information on nontribal landings or fish caught in the ocean area and landed on West Coast WOC fish tickets.
Fishing communities of the West Coast depend on commercial and/or recreational fisheries for many species. Participants in these fisheries employ a variety of fishing gears and combinations of gears. Naturally, community patterns of fishery participation vary coast wide and seasonally based on species availability, the regulatory environment, and oceanographic and weather conditions. Each community is characterized by its unique mix of fishery operations, fishing areas and habitat types, seasonal patterns, and target species. While each community is unique, there are many similarities. For example, all face danger, safety issues, dwindling resources, and a multitude of state and federal regulations.

Individuals make up unique communities with differing cultural heritages and economic characteristics. Examples include a Vietnamese fishing community of San Francisco Bay, an Italian fishing community of southern California and the Native American communities with an interest in the groundfish fisheries. In most areas, fishers with a variety of ethnic backgrounds come together to form the fishing communities within local areas, drawn together by their common interests in economic and physical survival in an uncertain and changing ocean and regulatory environment. Demographic information on geographic communities at the county level has been compiled for a general baseline description of West Coast fishing communities. This information may be downloaded from the Council web site (www.pcouncil.org).

In the year 2000, state level income impacts related to the commercial groundfish harvest and processing sector ($135 million) constituted 20% of a $675 million West Coast industry, excluding whiting delivered to at-sea processors, tribal commercial harvest, and harvest from inside marine fisheries (e.g., Puget Sound). Income impacts related to the groundfish fishery were the greatest in three Oregon port areas (Astoria/Tillamook, Newport, and Coos Bay), followed by Eureka, California, and Puget Sound ports in Washington.

Estimates of community income impacts for the recreational fishery are provided at a regional level. Precision of the MRFSS data, on which the trip estimates are based, do not allow estimates for substantially smaller geographic areas on an annual basis. The coastal community income associated with all ocean recreational fishing was estimated to be $245 million in 2000. The portion associated with groundfish was estimated at $44 million.

3.2.6 Health and Safety

3.3 Current Management Regime

The MSA describes Council membership and procedures at the most general level (Sec. 302). Regulations at 50 CFR 600 (Subpart B) add more detail and in particular require each council to prepare a statement of organization, practices, and procedures (SOPP). The Pacific Council SOPP specifies the membership and function of advisory bodies and annual management and activity cycles. Groundfish are managed through an annual process that establishes management measures for the fishing season, which corresponds to the calendar year. Ensuring a year round fishery, an FMP objective, has led to a complex regime of per-trip and cumulative monthly or bi-monthly landing limits. Further, from a management perspective the commercial fishery is divided into limited entry trawl, limited entry fixed gear, and open access sectors. In recent years management measures (primarily bag limits and seasons) have also been applied to recreational fisheries.

The Council’s SOPP describes either a four or five meeting process for groundfish annual measures. But in practice Council decision making related to annual management occurs over the course of two meetings, which in the past have been in September and November. Coordinating the availability of stock assessment information, decision making and federally required public comment on rule making has emerged as a major issue in recent years. Broadly speaking, NMFS or state management agencies conduct fishery-independent surveys on a periodic basis that is rarely more frequent than every other year. The results of these surveys are combined with information gathered from fisheries to conduct a stock assessment. (As noted in Section 3.1.2, actual stock status is known for the relatively few management unit species that are of commercial importance. For other species harvest limits may be set based on past landings, assuming this represents a level of fishing mortality that is relatively stable and below MSY.) Before 1995 a fairly informal process was used to vet stock assessments in advance of the use of results in decision making. In that year NMFS commissioned a review and recommended a more structured process. Since then a set of goals and objectives has guided Stock Assessment Review
(STAR) Panels that peer review work done by Stock Assessment Teams (STAT) comprising state and federal fishery scientists. Based on these goals and objectives, a process has developed that specifies the required elements of stock assessments, features external anonymous reviewers, and sets a calendar for completing and reviewing stock assessments so they are available to the Council ahead of decision making. Overall, the process is intended to clearly distinguish scientific analysis from management decisions.

This process begins with trawl and/or hydroacoustic surveys. The resulting data are used in the stock assessments that analyze stock structure and estimate its size. The STAT/STAR process is laborious and time consuming, typically taking ten months to a year to complete. The length of time involved not only reflects the difficulty of the work but the rigorous review that ensues. Therefore, stock assessments are not usually conducted every year and the Council will identify candidate stocks for formal assessment at its June meeting. Stock assessments must be completed by May if they are to be used in that year’s management cycle (which sets harvest levels and management measures for the next year). The Groundfish Management Team (GMT) then identifies alternative harvest levels. These will become part of the range of management alternatives in the environmental assessment of annual management measures, known as the annual specifications. The alternatives reflect the “acceptable biological catch” (ABC), a harvest level that is determined to be sustainable based on the scientific analysis in the stock assessment. The actual harvest level is expressed as an optimum yield (OY). The MSA defines OY as a yield that “will provide the greatest overall benefit to the Nation” and is less than MSY. More specifically, the Groundfish FMP describes the “40-10 default OY” policy that provides guidance for determining OY. When the stock size is less than which that can support MSY OY is reduced accordingly. At this point scientists have finished their work by specifying biologically acceptable levels of fishing mortality. It is now up to the Council to make policy decisions—within the constraints imposed by scientists—that balance competing sectoral interests and risks (due to uncertainty inherent in resource assessments) against potential costs (resulting from either under- or over-harvest).

As mentioned above, the Council reviews management alternatives and chooses its preferred alternative over the course of two meetings. The first meeting allows the Council to review and evaluate the alternatives sent up by the GMT. It may choose a preferred alternative at this point or wait until the next meeting to make its decision. In the interim the alternatives (possibly with a preferred alternative identified) are made available for public review. Council staff develop the environmental analysis that will become part of the environmental assessment guiding Council decisions. After the second Council meeting they complete the environmental analysis and the resulting document is submitted to NMFS so that they may begin the rule making process. Regulations for the ensuing year must be implemented before January 1. In the past the Council’s September and November meetings have been devoted to the process just described. However, a federal court ruled that NMFS was not allowing sufficient time for public comment during the rule making process. This necessitated emergency action to allow the 2002 season to begin on time (by continuing management measures from the previous year into the first two months of the new year). In response, the management cycle to develop 2003 management measures has been shifted to the 2002 June and September meetings. Even with this change NMFS may not have sufficient time to complete rule making by the end of the year. Because the process for developing annual management measures has become more complex and time consuming, and has detracted from the Council’s ability to conduct other business (not the least developing and implementing rebuilding plans), a multi-year management cycle is being discussed. Various scenarios are being considered, but all would...

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15/ The whiting fishery usually begins in April and the Council has the option of choosing harvest levels in March of the same year, as was the case in 2002. Because this species has been declared overfished harvest levels will be tied to a rebuilding plan until the stock is recovered. This necessitates decision making in the preceding year as with other stocks.

16/ The GMT is one of several advisory panels that develop management recommendations for Council review. It comprises scientists from NMFS and state fishery management agencies.

17/ An ABC is established for every stock (a species or species group) where enough information is available. However, numerical OYs are not established for every stock, especially where harvest has been less than the ABC. Species and species groups with OYs include bocaccio, canary rockfish, chilipepper rockfish, cowcod, darkblotted 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 (POP), Pacific whiting, sablefish, shortbelly rockfish, shortspine thornyhead, spiltfin rockfish, widow rockfish, yelloweye rockfish and yellowtail rockfish.
extend management measures for more than one year (most likely to two years) so that they don't have to be specified every year. This would allow the Council to focus on strategic measures in the "off year."
5.0 CONSISTENCY WITH FMP OBJECTIVES AND THE MAGNUSON-STEVEN S ACT

5.1 FMP Goals and Objectives

The Groundfish FMP goals and objectives are listed below. They way in which this amendment addresses each objective is briefly described in italics below the relevant statement.

Management Goals.

Goal 1 - Conservation. Prevent overfishing by managing for appropriate harvest levels and prevent any net loss of the habitat of living marine resources.

Goal 2 - Economics. Maximize the value of the groundfish resource as a whole.

Goal 3 - Utilization. Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

Objectives. To accomplish these management goals, a number of objectives will be considered and followed as closely as practicable:

Conservation.

Objective 1. Maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.

Measures in this amendment will not affect this objective. Procedures for periodically reviewing and changing rebuilding plans will depend on reliable information about resource status.

Objective 2. Adopt harvest specifications and management measures consistent with resource stewardship responsibilities for each groundfish species or species group.

Measures in this amendment will not affect this objective. But specified procedures for the adoption and implementation of rebuilding plans will facilitate effective management of overfished species.

Objective 3. For species or species groups which are below the level necessary to produce maximum sustainable yield (MSY), consider rebuilding the stock to the MSY level and, if necessary, develop a plan to rebuild the stock.

The standards and procedures in this amendment facilitate the adoption and implementation of rebuilding plans and therefore support this objective.

Objective 4. Where conservation problems have been identified for nongroundfish species and the best scientific information shows that the groundfish fishery has a direct impact on the ability of that species to maintain its long-term reproductive health, the Council may consider establishing management measures to control the impacts of groundfish fishing on those species. Management measures may be imposed on the groundfish fishery to reduce fishing mortality of a nongroundfish species for documented conservation reasons. The action will be designed to minimize disruption of the groundfish fishery, in so far as consistent with the goal to minimize the bycatch of nongroundfish species, and will not preclude achievement of a quota, harvest guideline, or allocation of groundfish, if any, unless such action is required by other applicable law.

Measures in this amendment do not address this objective.

Objective 5. Describe and identify essential fish habitat (EFH), adverse impacts on EFH, and other actions to conserve and enhance EFH, and adopt management measures that minimize, to the extent practicable, adverse impacts from fishing on EFH.

Measures in this amendment do not address this objective.
Economics.

Objective 6. Attempt to achieve the greatest possible net economic benefit to the nation from the managed fisheries.

This amendment does not address this objective directly. Rebuilding plan implementation should increase net benefits in the long term.

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.

Measures in this amendment do not address this objective.

Objective 8. Gear restrictions to minimize the necessity for other management measures will be used whenever practicable.

Measures in this amendment do not address this objective.

Utilization.

Objective 9. Develop management measures and policies that foster and encourage full utilization (harvesting and processing) of the Pacific coast groundfish resources by domestic fisheries.

Measures in this amendment do not address this objective.

Objective 10. Recognizing the multispecies nature of the fishery and establish a concept of managing by species and gear or by groups of interrelated species.

Measures in this amendment do not address this objective. Rebuilding plans are species- or stock-specific.

Objective 11. Strive to reduce the economic incentives and regulatory measures that lead to wastage of fish. Also, develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. In addition, promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve other information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

This amendment does not address this objective directly. The effect of harvest restrictions on bycatch rates could be addressed in rebuilding plans. Rebuilding plans must take into account total fishing mortality and rebuilding measures should also reduce bycatch.

Objective 12. Provide for foreign participation in the fishery, consistent with the other goals to take that portion of the optimum yield (OY) not utilized by domestic fisheries while minimizing conflict with domestic fisheries.

This objective is no longer relevant because the fishery has been declared fully utilized.

Social Factors.

Objective 13. When conservation actions are necessary to protect a stock or stock assemblage, attempt to develop management measures that will affect users equitably.

This amendment does not address this objective directly. Rebuilding plans may discuss allocation among sectors.

Objective 14. Minimize gear conflicts among resource users.
Measures in this amendment do not address this objective.

**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 environment.

*This amendment does not address this objective directly. The environmental impact analysis of rebuilding plan measures considers disruption of fishing, marketing and the environment. Some disruption is unavoidable.*

**Objective 16.** Avoid unnecessary adverse impacts on small entities.

*This amendment does not address this objective directly. Rebuilding plan measures may entail adverse impacts, but these are necessary to rebuild overfished stocks.*

**Objective 17.** Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.

*This amendment does not address this objective directly. The environmental impact analysis of rebuilding plan measures considers impacts to communities.*

**Objective 18.** Promote the safety of human life at sea.

*Measures in this amendment do not address this objective although the environmental impact analysis considers safety issues.*

Although Amendment 12, the original document specifying rebuilding plan form and content, was remanded in part, the goals and objectives for rebuilding plans enumerated in that document are still relevant. The amendment described five goals, which can be re-cast as objectives falling under the three FMP goals:

**Conservation**

1. Achieve the population size and structure that will support the maximum sustainable yield within the specified time period.
2. Protect the quantity and quality of habitat necessary to support the stock at healthy levels in the future.
3. Promote widespread public awareness, understanding and support for the rebuilding program.

**Economics**

4. Minimize, to the extent practicable, the social and economic impacts associated with rebuilding, including adverse impacts on fishing communities.

**Utilization**

5. Fairly and equitably distribute both the conservation burdens (overfishing restrictions) and recovery benefits among commercial, recreational and charter fishing sectors.

This amendment adheres to these objectives in establishing rebuilding plan elements and plan implementation and review procedures.

### 5.2 National Standards

An FMP or plan amendment and any pursuant regulations must be consistent with ten national standards contained in the Magnuson-Stevens Act (§301). These are:
National Standard 1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

This amendment supports National Standard 1 by facilitating the adoption and implementation of rebuilding plans.

National Standard 2 states that conservation and management measures shall be based on the best scientific information available.

Rebuilding plans are based on rebuilding analyses that use the most recent stock assessment data and incorporate statistical measures of the likelihood that overfished stocks will recover within a mandated time period. These stock assessments and analyses are conducted by state and federal agency staff scientists with expertise in Pacific groundfish biology, ecology, and fishery science. They employ the best available data.

National Standard 3 states that, to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

Pacific groundfish are managed on the basis of known stocks when these can be differentiated from the total range of the species. Overfished species are managed individually in that harvest levels are determined for each stock. But managers recognize that many groundfish stocks share common habitats and ecosystems, and fishers may catch them as part of a multi-species complex. This allows unit management of interrelated stocks.

National Standard 4 states that conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges. The proposed measures will not discriminate between residents of different States.

This amendment and consequent rebuilding plans, to the degree that they specify allocation between sectors, will do so in a fair and equitable manner. Allocation decisions may be guided by rebuilding plan objectives and specific policies described in the plans. These decisions are made through the Council process and accordance with its established procedures and policies.

National Standard 5 states that conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

This amendment and resulting rebuilding plans do not address this National Standard directly, except that no measures are intended to allocate groundfish resources solely for the purpose of economic efficiency.

National Standard 6 states that conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources and catches.

This amendment and resulting rebuilding plans recognize the differences between the various groundfish fishery sectors. Different sectors may have different catch levels for overfished species and capacity to avoid or minimize catch of overfished species. Although their primary purpose of measures described in this amendment is to allow overfished stocks to recover, differential impacts were considered when formulating them.

National Standard 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Rebuilding plans will be implemented, reviewed and updated in a consistent and specific manner based on the measures in this amendment. Rebuilding plan measures are implemented through the annual
specification of management measures developed for the whole groundfish fishery. This approach is intended to minimize cost and duplication.

National Standard 8 states that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The analyses supporting this amendment and the individual rebuilding plans (organized around NEPA requirements) consider the socioeconomic impacts to fishing communities. Rebuilding plans generally do not employ a policy that would rebuild stocks in the minimum time period, which would very likely require a complete cessation of many fisheries. This is meant to minimize impacts to communities by allowing some level of fishing mortality on overfished stocks while identifying a trajectory that will lead to their eventual recovery.

National Standard 9 states that conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Most overfished species are no longer targeted and in many cases only constitute bycatch due to regulatory discards. Because rebuilding plans must account for total fishing mortality, strategies must minimize bycatch. Rebuilding plan environmental impact analyses also evaluate the impact of the alternative management measures on bycatch.

National Standard 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

This amendment does not directly affect safety. Indirect effects of rebuilding plan measures on safety are considered in the environmental analyses.

5.3 Other Applicable Magnuson-Stevens Act Provisions

This amendment and associated rebuilding plans conform to Section 304(e)—Rebuild Overfished Fisheries. The procedural measures described in Part A address the requirement that the Council "shall prepare a fishery management plan, plan amendment, or proposed regulations ... to end overfishing in the fishery and to rebuild affected stocks..." (§304(e)(3)). Pursuant rebuilding plans contain the elements required by Section 304(e)(4) and discussed in National Standard guidelines (50 CFR 600.310).
6.0 OTHER APPLICABLE LAW

6.1 National Environmental Policy Act

This document has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 to assess the impacts on the human environment that may result from the proposed action. It contains the elements consistent with an Environmental Impact Statement as described at 40 CFR Part 1502. The recommended format described at 40 CFR 1502.10 includes:

(a) Cover sheet.
(b) Summary.
(c) Table of contents.
(d) Purpose of and need for action. (Section 1 of the document.)
(e) Alternatives including proposed action (Section 2)
(f) Affected environment. (Section 3)
(g) Environmental consequences (Section 4)
(h) List of preparers. (Section 7.4)
(i) List of Agencies, Organizations, and persons to whom copies of the statement are sent. (Section 7.2)
(j) Index.
(k) Appendices (if any).

6.2 Regulatory Impact Review and Regulatory Flexibility Act Determination

In order to comply with Executive Order (EO) 12866 and the Regulatory Flexibility Act (RFA), this document also serves as a Regulatory Impact Review (RIR) and an Initial Regulatory Flexibility Analysis (IRFA).

6.2.1 Executive Order 12866 (Regulatory Impact Review)

EO 12866, Regulatory Planning and Review, was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. The EO covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. Section 1 of the Order deals with the regulatory philosophy and principles that are to guide agency development of regulations. It stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits across all regulatory alternatives. Based on this analysis, they should choose those approaches that maximize net benefits to society.

The regulatory principles in EO 12866 emphasize careful identification of the problem to be addressed. The agency is to identify and assess alternatives to direct regulation, including economic incentives such as user fees or marketable permits, to encourage the desired behavior. When an agency determines that a regulation is the best available method of achieving the regulatory objective, it must design its regulations in the most cost-effective manner to achieve the regulatory objective. Each agency is to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only after reasoned determination that the benefits of the intended regulation justify the costs. In reaching its decision agency must use the best reasonably obtainable information, including scientific, technical and economic data, about the need for and consequences of the intended regulation.

NMFS requires the preparation of an RIR for all regulatory actions of public interest, including those that either implement a new FMP or significantly amend an existing FMP or its implementing regulations. The RIR is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure the regulatory agency systematically and comprehensively considers all available alternatives, so the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of EO 12866.
The RIR analysis and an EIS required by NEPA have many common elements and they have been combined in this document. The following table shows where the elements of an RIR, as required by EO 12866, are located.

<table>
<thead>
<tr>
<th>Required RIR Elements</th>
<th>Corresponding Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of management objectives</td>
<td>Sections 1 and 5</td>
</tr>
<tr>
<td>Description of the fishery&lt;sup&gt;18&lt;/sup&gt;</td>
<td>Section 3.2</td>
</tr>
<tr>
<td>Statement of the problem</td>
<td>Section 1.2</td>
</tr>
<tr>
<td>Description of each selected alternative</td>
<td>Section 2</td>
</tr>
<tr>
<td>An economic analysis of the expected effects</td>
<td>Section 4.2</td>
</tr>
<tr>
<td>of each selected alternative relative to status quo</td>
<td></td>
</tr>
</tbody>
</table>

The RIR is designed to determine whether the proposed actions could be considered “significant regulatory actions” according to EO 12866. The following table identifies EO 12866 test 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. [For the purposes of the EO, none of the proposed alternatives would meet its criteria for a significant regulatory action.] A regulatory program is “economically significant” if it is likely to result in the effects described in item 1 in the table:

<table>
<thead>
<tr>
<th>EO 12866 Test of “Significant Regulatory Actions”</th>
<th>Status Quo</th>
<th>Preferred Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Create a serious inconsistency or otherwise interfere with action taken or planned by another agency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof</td>
<td></td>
<td></td>
</tr>
<tr>
<td>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</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.2.2 Impacts on Small Entities (Regulatory Flexibility Act, RFA)

---

<sup>18</sup> In addition to the information in this document, basic economic information is provided annually in the Council’s SAFE document.
The RIR is also designed to determine whether the proposed rule has a "significant economic impact on a substantial number of small entities" under the RFA. The purpose of the RFA is to relieve small businesses, small organizations, and small governmental entities of burdensome regulations and record-keeping requirements. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action. An initial regulatory flexibility analysis (IRFA) is conducted unless it is determined that an action will not have a "significant economic impact on a substantial number of small entities." The RFA requires that an initial regulatory flexibility analysis include elements that are similar to those required by EO 12866 and NEPA. Therefore, the IRFA has been combined with the RIR and NEPA analyses. The following table references the location of these RFA-required elements:

<table>
<thead>
<tr>
<th>Required IRFA Elements</th>
<th>Corresponding Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>A description of the reasons why action by the agency is being considered.</td>
<td>Section 1.2</td>
</tr>
<tr>
<td>A succinct statement of the objectives of, and the legal basis for, the proposed rule.</td>
<td>Sections 1 and 5</td>
</tr>
<tr>
<td>A description of and, where feasible, an estimate of the number of small entities to</td>
<td>Section 3.2</td>
</tr>
<tr>
<td>which the proposed rule will apply (including a profile of the industry divided into</td>
<td>Section 6.5 and below</td>
</tr>
<tr>
<td>industry segments, if appropriate).</td>
<td>See below</td>
</tr>
<tr>
<td>A description of the projected reporting, record keeping and other compliance</td>
<td>Section 2</td>
</tr>
<tr>
<td>requirements of the proposed rule, including an estimate of the classes of small</td>
<td></td>
</tr>
<tr>
<td>entities that will be subject to the requirement and the type of professional skills</td>
<td></td>
</tr>
<tr>
<td>necessary for preparation of the report or record.</td>
<td></td>
</tr>
<tr>
<td>An identification to the extent practicable, of all relevant Federal rules that may</td>
<td></td>
</tr>
<tr>
<td>duplicate, overlap or conflict with the proposed rule.</td>
<td></td>
</tr>
<tr>
<td>A description of any significant alternatives to the proposed rule that</td>
<td></td>
</tr>
<tr>
<td>accomplish the stated objectives that would minimize any significant</td>
<td></td>
</tr>
<tr>
<td>economic impact of the proposed rule on small entities.</td>
<td></td>
</tr>
</tbody>
</table>

[additional discussion and analysis of requirements referenced in above table.]

The actions considered in this document may have significant impacts on small entities. Public comment is invited on adjustments that would reduce the impacts on small entities while achieving the regulatory objectives and on whether the analysis adequately takes into account impacts on small entities.

6.3 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act (CZMA) of 1972 requires all federal activities which directly affect the coastal zone be consistent with approved, state coastal zone management programs to the maximum extent practicable. Section 11.7.3 of the Groundfish FMP discusses consistency with the coastal zone management programs of Washington, Oregon, and California. The measures proposed in this amendment are within the scope of that discussion and are consistent, to the maximum extent practicable, with these state programs.

In accordance with regulations at 15 CFR 930.54 (unlisted federal license or permit activities) a copy of the Draft EIS is transmitted to coastal zone management programs for review.

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1" The Small Business Administration defines a small business in commercial fishing "as a fish harvesting or hatchery business that is independently owned and operated and not dominant in its field of operation" with "annual receipts not in excess of $3,000,000."
6.4 Listed Species

Section 3.5 describes species listed under the Endangered Species Act and managed under the Marine Mammal Protection Act, and seabirds protected or given special consideration by law and NMFS policy that occur off the West Coast and may be affected by the groundfish fishery. Section 4.x considered potential effects of the alternatives on these species and found that they are not affected.

6.4.1 Endangered Species Act

6.4.2 Marine Mammal Protection Act

6.4.3 Seabirds

6.5 Paperwork Reduction Act

6.6 Executive Order 13132 (Federalism)
7.0 Reference Material

7.1 Bibliography


7.2 Agencies, Organizations, and Persons Receiving a Copy of This EIS

7.3 List of Federal Register Notices Published in Connection With This Action

7.4 List of Preparers

Christopher Dahl, John DeVore, Jim Seger, Chuck Tracy
Pacific Fishery Management Council
Appendix A
Amendments to FMP Language

This appendix documents revisions to the language of the FMP which could result from Council action under each of the five issues presented in Chapter 2 of this document.

GUIDE TO SECTIONS AFFECTED BY ISSUES CONSIDERED IN THE FMP AMENDMENT

<table>
<thead>
<tr>
<th>Issue</th>
<th>Affected Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue 1 Form &amp; Required Elements of Species Rebuilding Plans</td>
<td>4.5.2</td>
</tr>
<tr>
<td></td>
<td>4.5.2.2</td>
</tr>
<tr>
<td></td>
<td>4.5.2.3</td>
</tr>
<tr>
<td>Issue 2 Periodic Review and Rebuilding Plan Amendment</td>
<td>4.5.2.2 -Option 2c Only</td>
</tr>
<tr>
<td></td>
<td>4.5.2.4</td>
</tr>
<tr>
<td>Issue 3 Adequacy of Progress</td>
<td>4.5.2.1</td>
</tr>
<tr>
<td></td>
<td>4.5.2.2 -Option 3d Only</td>
</tr>
<tr>
<td></td>
<td>4.5.2.4</td>
</tr>
<tr>
<td>Issue 4 ESA Listed Species</td>
<td>4.5.2.5</td>
</tr>
<tr>
<td>Issue 5 Housekeeping Measures</td>
<td>All Sections of Chapters 4 and 5</td>
</tr>
</tbody>
</table>

The following is the table of contents for the affected sections.

TABLE OF CONTENTS FOR THE AFFECTED SECTIONS OF THE FMP

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0 AREAS AND STOCKS INVOLVED</td>
<td>A-2</td>
</tr>
<tr>
<td>3.1 Species Managed by this Fishery Management Plan</td>
<td></td>
</tr>
<tr>
<td>4.0 PREVENTING OVERFISHING AND ACHIEVING OPTIMUM YIELD</td>
<td>A-4</td>
</tr>
<tr>
<td>4.1 Species Categories (Previously portions of 5.3, as indicated)</td>
<td>A-4</td>
</tr>
<tr>
<td>4.2 Determination of MSY or MSY Proxy and B_{mav} (Previously 5.2)</td>
<td>A-5</td>
</tr>
<tr>
<td>4.3 Determination of ABC (Previously 5.3)</td>
<td>A-7</td>
</tr>
<tr>
<td>4.3.1 Determination of ABC (Previously 5.3.1)</td>
<td>A-8</td>
</tr>
<tr>
<td>4.3.1.1 Stocks with Quantitative Assessments, Category 1 (Previously 5.3.1.1)</td>
<td>A-8</td>
</tr>
<tr>
<td>4.3.1.2 Stocks with ABC Set by Nonquantitative Assessment, Category 2 (Previously 5.3.1.2)</td>
<td>A-8</td>
</tr>
<tr>
<td>4.3.1.3 Stocks Without ABC Values, Category 3 (Previously 5.3.1.3)</td>
<td>A-8</td>
</tr>
<tr>
<td>4.4 Precautionary Thresholds and Overfishing Status Determination Criteria (NEW SECTION TITLE)</td>
<td>A-8</td>
</tr>
<tr>
<td>4.4.1 Determination of Precautionary Thresholds (Previously 5.3.3)</td>
<td>A-8</td>
</tr>
<tr>
<td>4.4.2 Determination of Overfishing Threshold (NEW SECTION)</td>
<td>A-9</td>
</tr>
<tr>
<td>4.4.3 Determination of Overfished/Rebuilding Thresholds (Previously 5.3.4)</td>
<td>A-10</td>
</tr>
<tr>
<td>4.5 Ending Overfishing and Rebuilding (New Section Title)</td>
<td>A-10</td>
</tr>
<tr>
<td>4.5.1 Default Precautionary and Interim Rebuilding OY Calculation (Previously 5.3.5)</td>
<td>A-10</td>
</tr>
</tbody>
</table>
3.0 AREAS AND STOCKS INVOLVED

* * *

3.1 Species Managed by this Fishery Management Plan

Table 3-1 is the listing of species managed under this FMP.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leopard shark</td>
<td>Triakis semifasciata</td>
</tr>
<tr>
<td>Soupfin shark</td>
<td>Galeorhinus zyopterus</td>
</tr>
<tr>
<td>Spiny dogfish</td>
<td>Squalus acanthias</td>
</tr>
<tr>
<td>Big skate</td>
<td>Raja binoculata</td>
</tr>
<tr>
<td>California skate</td>
<td>R. inornata</td>
</tr>
<tr>
<td>Longnose skate</td>
<td>R. rhina</td>
</tr>
<tr>
<td>Ratfish</td>
<td>Hydrologus colliei</td>
</tr>
<tr>
<td>Finescale codling</td>
<td>Antimora microlepis</td>
</tr>
<tr>
<td>Pacific rattail</td>
<td>Coryphaenoides acrolepis</td>
</tr>
<tr>
<td>Lingcod</td>
<td>Ophiodon elongatus</td>
</tr>
<tr>
<td>Cabezon</td>
<td>Scorpaenichthys marmoratus</td>
</tr>
<tr>
<td>Kelp greenling</td>
<td>Hexagrammos decagrammus</td>
</tr>
<tr>
<td>Pacific cod</td>
<td>Gadus macrocephalus</td>
</tr>
<tr>
<td>Pacific whiting (hake)</td>
<td>Merluccius productus</td>
</tr>
<tr>
<td>Sablefish</td>
<td>Anoplopoma fimbria</td>
</tr>
<tr>
<td></td>
<td><strong>ROCKFISH</strong></td>
</tr>
</tbody>
</table>

GF FMP Amendment 16
Volume 1 - Process and Standards for Rebuilding Plans A-2
June 2002
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aurora rockfish</td>
<td>Sebastes aurora</td>
</tr>
<tr>
<td>Bank rockfish</td>
<td>S. rufus</td>
</tr>
<tr>
<td>Black rockfish</td>
<td>S. me Ianops</td>
</tr>
<tr>
<td>Black and yellow rockfish</td>
<td>S. chrysmelas</td>
</tr>
<tr>
<td>Blackgill rockfish</td>
<td>S. melanostomus</td>
</tr>
<tr>
<td>Blue rockfish</td>
<td>S. mystinus</td>
</tr>
<tr>
<td>Bocaccio</td>
<td>S. paucispinis</td>
</tr>
<tr>
<td><strong>Bronze-spotted</strong> Bronze-spotted rockfish</td>
<td>S. gilli</td>
</tr>
<tr>
<td>Brown rockfish</td>
<td>S. auriculatus</td>
</tr>
<tr>
<td>Calico rockfish</td>
<td>S. dallii</td>
</tr>
<tr>
<td>California scorpionfish</td>
<td>Scoprea gutatta</td>
</tr>
<tr>
<td>Canary rockfish</td>
<td>Sebastes pinniger</td>
</tr>
<tr>
<td><strong>Chameleon rockfish</strong></td>
<td>S. philippi</td>
</tr>
<tr>
<td>Chilipepper</td>
<td>S. goodei</td>
</tr>
<tr>
<td>China rockfish</td>
<td>S. nebulosus</td>
</tr>
<tr>
<td>Copper rockfish</td>
<td>S. caurinus</td>
</tr>
<tr>
<td>Cowcod</td>
<td>S. levis</td>
</tr>
<tr>
<td>Darkblotched rockfish</td>
<td>S. crameri</td>
</tr>
<tr>
<td>Dusky rockfish</td>
<td>S. ciliatus</td>
</tr>
<tr>
<td><strong>Dwarf-red rockfish</strong></td>
<td>S. rufianus</td>
</tr>
<tr>
<td>Flag rockfish</td>
<td>S. rubrivinctus</td>
</tr>
<tr>
<td>Freckled rockfish</td>
<td>S. lentiginosus</td>
</tr>
<tr>
<td>Gopher rockfish</td>
<td>S. camatus</td>
</tr>
<tr>
<td>Grass rockfish</td>
<td>S. rastrelliger</td>
</tr>
<tr>
<td>Greenblotched rockfish</td>
<td>S. rosenblatti</td>
</tr>
<tr>
<td>Greenspotted rockfish</td>
<td>S. chlorostictus</td>
</tr>
<tr>
<td>Greenstriped rockfish</td>
<td>S. elongatus</td>
</tr>
<tr>
<td><strong>Halibanded rockfish</strong></td>
<td>S. semicinctus</td>
</tr>
<tr>
<td>Hatfieldiun rockfish</td>
<td>S. variegatus</td>
</tr>
<tr>
<td>Honeycomb rockfish</td>
<td>S. umbrosus</td>
</tr>
<tr>
<td>Kelp rockfish</td>
<td>S. atrovirens</td>
</tr>
<tr>
<td>Longspine thornyhead</td>
<td>Sebastolobus altivelis</td>
</tr>
<tr>
<td>Mexican rockfish</td>
<td>Sebastes macdonaldii</td>
</tr>
<tr>
<td>Olive rockfish</td>
<td>S. serrandies</td>
</tr>
<tr>
<td>Pink rockfish</td>
<td>S. eos</td>
</tr>
<tr>
<td><strong>Pinkrose rockfish</strong></td>
<td>S. simulator</td>
</tr>
<tr>
<td><strong>Pygmy rockfish</strong></td>
<td>S. wilsoni</td>
</tr>
<tr>
<td>Pacific ocean perch</td>
<td><strong>Sebastes S. alutus</strong></td>
</tr>
<tr>
<td>Quillback rockfish</td>
<td>S. maliger</td>
</tr>
<tr>
<td>Redbanded rockfish</td>
<td>S. babcocki</td>
</tr>
<tr>
<td>Redstripe rockfish</td>
<td>S. proniger</td>
</tr>
<tr>
<td>Rosethorn rockfish</td>
<td>S. helvomaculatus</td>
</tr>
<tr>
<td>Rosy rockfish</td>
<td>S. rosaceus</td>
</tr>
<tr>
<td>Rougheye rockfish</td>
<td>S. aleutianus</td>
</tr>
<tr>
<td>Sharpchin rockfish</td>
<td>S. zacentrus</td>
</tr>
<tr>
<td>Shortbeiley rockfish</td>
<td>S. jordani</td>
</tr>
<tr>
<td>Shortraker rockfish</td>
<td>S. borealis</td>
</tr>
<tr>
<td>Shortspine thornyhead</td>
<td>Sebastolobus alascanus</td>
</tr>
<tr>
<td>Silvergray rockfish</td>
<td>Sebastes brevispinis</td>
</tr>
<tr>
<td>Speckled rockfish</td>
<td>S. ovalis</td>
</tr>
<tr>
<td>Splitnose rockfish</td>
<td>S. diploproa</td>
</tr>
<tr>
<td>Squarespot rockfish</td>
<td>S. hopkinsi</td>
</tr>
<tr>
<td>Starry rockfish</td>
<td>S. constellatus</td>
</tr>
<tr>
<td>Striptail rockfish</td>
<td>S. saxicola</td>
</tr>
<tr>
<td><strong>Swordspine rockfish</strong></td>
<td>S. ensifer</td>
</tr>
<tr>
<td>Tiger rockfish</td>
<td>S. nigrocinctus</td>
</tr>
<tr>
<td>Treefish</td>
<td>S. serriceps</td>
</tr>
<tr>
<td>Vermillion rockfish</td>
<td>S. miniatus</td>
</tr>
<tr>
<td><strong>Widow rockfish</strong></td>
<td>S. entomelas</td>
</tr>
<tr>
<td>Yelloweye rockfish</td>
<td>S. ruberrimus</td>
</tr>
<tr>
<td>Yellowmouth rockfish</td>
<td>S. reedii</td>
</tr>
<tr>
<td>Yellowtail rockfish</td>
<td>S. flavidus</td>
</tr>
</tbody>
</table>
TABLE 3-1. Common and scientific names of species included in this FMP.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrowtooth flounder (turbot)</td>
<td>FLATFISH</td>
</tr>
<tr>
<td>Butter sole</td>
<td>Atheresthes stomias</td>
</tr>
<tr>
<td>Cuffin sole</td>
<td>Isopsetta isolepis</td>
</tr>
<tr>
<td>Dover sole</td>
<td>Pleuronichthys decurans</td>
</tr>
<tr>
<td>English sole</td>
<td>Microstomus pacificus</td>
</tr>
<tr>
<td>Flathead sole</td>
<td>Parophrys vetulus</td>
</tr>
<tr>
<td>Flatfish (continued)</td>
<td></td>
</tr>
<tr>
<td>Flathead sole</td>
<td>Hippoglossoides elassodon</td>
</tr>
<tr>
<td>Pacific sanddab</td>
<td>Citharinichthys sordidus</td>
</tr>
<tr>
<td>Petrale sole</td>
<td>Eopsetta jordani</td>
</tr>
<tr>
<td>Rex sole</td>
<td>Glyptocephalus zachirus</td>
</tr>
<tr>
<td>Rock sole</td>
<td>Lepidopsetta bilineata</td>
</tr>
<tr>
<td>Sand sole</td>
<td>Paedichthys melanostictus</td>
</tr>
<tr>
<td>Starry flounder</td>
<td>Platichthys stellatus</td>
</tr>
</tbody>
</table>

*a* The category “rockfish” includes all genera and species of the family Scopaeidae Scopaeinae, even if not listed, that occur in the Washington, Oregon, and California area. The Scopaeidae Scopaeinae genera are Sebastes, Scorpaea, Sebastolobus, and Scler Scopaeinae.

* * *

4.0 PREVENTING OVERFISHING AND ACHIEVING OPTIMUM YIELD

National Standard 1 requires that “Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the U.S. fishing industry.” (50 CFR Section 600.310(a))

“The determination of OY is a decisional mechanism for resolving the MSA’s multiple purposes and policies, implementing an FMP’s objectives and balancing the various interests that comprise the national welfare. OY is based on MSY, or on MSY as it may be reduced ... [in consideration of social, economic or ecological factors] ... The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing.” (50 CFR Section 600.310(b))

This chapter addresses the essential considerations suggested for National Standard 1, as identified in the NMFS guidelines on the standard (600.310):

- estimating MSY, estimated the MSY biomass and setting the MSY control rule (50 CFR Section 600.310(c)) [Section 4.2 of this Chapter]
- specifying stock status determination criteria (maximum fishing mortality threshold and minimum stock size threshold, or reasonable proxies thereof) (50 CFR Section 600.310(d)) [Section 4.4 of this Chapter]
- actions for ending overfishing and rebuilding overfished stocks (including the development and adoption of rebuilding plans) (50 CFR Section 600.310(e)) [Section 4.5 of this Chapter]
- setting OY and apportionment of harvest levels (50 CFR Section 600.310(f)) [Section 4.6 of this Chapter]

In establishing OYs for West Coast groundfish, this FMP utilizes the interim step of calculating ABCs for major stocks or management units (groups of species). ABC is the MSY harvest level associated with the current stock abundance. Over the long term, if ABCs are fully harvested, the average of the ABCs would be MSY.

**OY is set and apportioned under the procedures outlined in Chapter 5.**

4.1 Species Categories (Previously portions of 5.3, as indicated)

ABC=B_{\text{msy}} ABC and overfished/rebuilding stock size threshold cannot be precisely defined for all species, because of the absence of available information for many species managed under the FMP. [PRECEDING
For the purpose of setting MSY, ABC, MFMT, MSST, OY and rebuilding standards, three categories of species are identified. Following was previously Section 5.3, Para 3) The first are the relatively few species for which a quantitative stock assessment can be conducted on the basis of catch-at-age or other data. ABCs and overfished/rebuilding thresholds can generally be calculated for these species. The second category includes a large number of species for which some biological indicators are available, but a quantitative analysis cannot be conducted. It is difficult to estimate overfished and overfishing thresholds for the second category of species a priori, but indicators of long-term potential overfishing can be identified. ABCs for species in this category are typically set at a constant level and some monitoring is necessary to determine if this level of catch is causing a slow decline in stock abundance. The third category includes minor species which are caught, but for which there is, at best, only information on landed biomass. For species in this category, it is impossible to determine MSY, ABC, or an overfished threshold.

4.2 Determination of MSY or MSY Proxy and B_{msy} (Previously 5.2)

Harvest policies are to be specified according to standard reference points such as MSY (MSY, interpreted as an a maximum average achievable catch under prevailing ecological and environmental conditions over a prolonged period), the long-term average biomass associated with fishing at F_{msy} is B_{msy}, the biomass that produces MSY (B_{msy}) and the fishing rate (F_{msy}) that tends to hold biomass near B_{msy}.

In this FMP, MSY generally refers to a constant F control rule that is assumed to produce the maximum average yield over time while protecting the spawning potential of the stock. Thus the constant F control rule is generally the proxy for the MSY control rule. (Pacific whiting is generally based on a variable F control rule.) Fishing rates above F_{msy} eventually result in biomass smaller than B_{msy} and produce less harvestable fish on a sustainable basis. Accordingly, management should avoid fishing rates that hold biomass below B_{msy} for long periods. The biomass level that produces MSY (i.e., B_{msy}) is generally unknown and assumed to be variable over time due to long-term fluctuations in ocean conditions, so that no single value is appropriate. [Previous sentence moved from below] This is especially important during periods of unfavorable environment in which resources may be less productive than usual and the risk of stock depletion is greater. During periods of unfavorable environment it is important to account for reduced sustainable yield levels.

The problem with an F_{msy} control rule is that it is tightly linked to an assumed level of density-dependence in recruitment, and there is insufficient information to determine the level of density-dependence in recruitment for many West Coast groundfish stocks. Therefore, the use of approximations or proxies is necessary. Absent a more accurate determination of F_{msy}, the Council will apply default MSY proxies. The current (1998-2001) proxies are: F_{40%} for flatfish and whiting, F_{50%} for rockfish (including thornyheads) and F_{45%} F_{95%} for all species such as sablefish and lingcod except rockfish and F_{49%} for rockfish. However, these values (F_{95%}, F_{40%}, F_{45%} and F_{49%}, F_{50%}) are provided here as examples only and are expected to be modified from time to time as scientific knowledge improves. If available information is sufficient, values of F_{msy}, B_{msy} and more appropriate harvest control rules may be developed for any species or species group. For example, the Council generally has applied a variable F control rule for management of Pacific whiting.

At this time, it is generally believed that, for many species, F_{95%} F_{45%} strikes a balance between obtaining a large fraction of the MSY if recruitment is highly insensitive to reductions in spawning biomass and preventing a rapid depletion in stock abundance if recruitment is found to be extremely sensitive to reductions in spawning biomass. The long-term expected yield under an F_{95%} F_{45%} policy depends upon the (unknown) level of density-dependence in recruitment. The recommended level of harvest will reduce the average lifetime egg production by each female entering the stock to 95% 45% of the lifetime egg production for females that are unfished.

Because the level of recruitment is expected to decline somewhat as a stock is fished at F_{95%}, the expected B_{msy}, proxy is less than 45% of the unfished biomass. A biomass level of 40% is a reasonable proxy for B_{msy}. The short-term yield under an F_{95%} F_{45%} policy will vary as the abundance of the exploitable stock varies. This is true for any fishing policy that is based on a constant exploitation rate. The

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1/ In the rest of this document use of F_{95%} will be taken to mean F_{40%} in the case of rockfish, and the hybrid fishing mortality rate strategy for Pacific whiting.
abundance of the stock will vary, because of the effects of fishing, and because of natural variation in recruitment. When stock abundance is high (i.e., near its average unfished level), short-term annual yields can be approximately two to three times greater than the expected long-term average annual yield. For many of the long-lived groundfish species common on the West Coast, this "fishing down" transition can take decades. Many of the declines in ABC that occurred during the 1980s were the result of this transition from a lightly exploited, high abundance stock level to a fully exploited, moderately abundant stock level. Further declines below the overfished levels in the 1990s were due mostly to much lower than expected recruitment.

Recent work (Clark 1993, Mace 1994, and Lanelli 1995) indicates that $F_{45\%}$ may not be the best approximation of $F_{msy}$-given more realistic information about recruitment than was initially used by Clark in 1991. In his 1993 publication Clark extended his 1991 results by improving the realism of his simulations and analysis. In particular he (1) modeled stochasticity into the recruitment process; (2) introduced serial correlation into recruitment time series; and (3) performed separate analyses for the Ricker- and Beverton-Holt-spawner-recruit functions. For rockfish, these changes improved the realism of his spawning biomass per recruit (SPR) harvest policy calculations, because these species are known to have stochastic recruitment and they appear to display serial correlation in recruitments (especially on interdecadal time scales); and because the Beverton-Holt spawner-recruit curve may be biologically the most plausible recruitment model: The effect of each of these changes, in isolation and in aggregate, was to decrease $F_{msy}$. Consequently, the estimated SPR reduction needed to provide an optimal $F_{msy}$ proxy (defined as that level of fishing which produces the largest assured proportion of MSY), must necessarily be increased. Clark concluded that $F_{40\%}$ is the optimal rate for fish stocks exhibiting recruitment variability similar to Alaska groundfish stocks. Likewise, Mace (1994) recommended the use of $F_{40\%}$ as the target mortality rate when the stock-recruitment relationship is unknown. Lastly, Lanelli (1995) determined that $F_{44\%}$ was a good $F_{msy}$ proxy for Gulf of Alaska Pacific ocean perch, although he subsequently indicated that a recent recruitment to that stock was larger than expected and that $F_{44\%}$ may be too conservative in that case.

Based on this information and advice by its Groundfish Management Team, in 1997 the Council concluded that $F_{40\%}$ should be used as the proxy for $F_{msy}$ for rockfish in the absence of specific knowledge of recruitment or life history characteristics which would allow a more accurate determination of $F_{msy}$. This and other proxies may be revised on the basis of further information and experience.

In spring 2000, the Council’s Scientific and Statistical Committee (SSC) sponsored a workshop to review the Council’s groundfish exploitation rate policy. The workshop explored the historic use of different fishing mortality ($F$) rates, and found that the Council’s past practices have generally changed in response to new information from the scientific community. Starting in the early 1990s, the Council used a standard harvest rate of $F_{35\%}$. The SSC’s workshop participants reported that new scientific studies in 1998 and 1999 had shown that the $F_{35\%}$ and $F_{40\%}$ rates used by the Council had been too aggressive for Pacific coast groundfish stocks, such that some groundfish stocks could not maintain a viable population over time. A 1999 study, “The Meta-Analysis of the Maximum Reproductive Rate for Fish Populations to Estimate Harvest Policy: a Review” (Myers, et al.) showed that Pacific coast groundfish stocks, particularly rockfish, have very low productivity compared to other, similar species worldwide. One prominent theory about the reason for this low productivity is the large-scale, North Pacific climate shifts that are thought to cycle Pacific coast waters through warm and cool phases of 20-30 years duration. Pacific coast waters shifted to a warm phase around 1977-78, with ocean conditions less favorable for Pacific coast groundfish and other fish stocks. Lower harvest rates are necessary to guard against steep declines in abundance during these periods of low productivity (low recruitment). After an intensive review of historic harvest rates, and current scientific literature on harvest rates and stock productivity, the SSC workshop concluded that $F_{40\%}$ is too aggressive for many Pacific coast groundfish stocks, particularly for rockfish. For 2001 and beyond, the Council adopted the SSC’s new recommendations for harvest policies of: $F_{40\%}$ for flatfish and whiting, $F_{50\%}$ for rockfish (including thornyheads) and $F_{45\%}$ for other groundfish such as sablefish and lingcod.
In the past, $F_{\text{may}}$, these fishing rates were treated by the Council (as intended) as targets. Under the Magnuson-Stevens Act as amended in 1996, these fishing rates are more appropriately considered to be limits thresholds which should not be exceeded (see Section 4.4).

The Council will consider any new scientific information relating to calculation of MSY or MSY proxies and may adopt new values based on improved understanding of the population dynamics and harvest of any species or group of species.

The biomass level that produces MSY (i.e., $B_{\text{may}}$) is also generally unknown and assumed to be variable over time due to long-term fluctuations in ocean conditions, so that no single value is appropriate. Current scientific thought is that $B_{\text{may}}$ (and/or the natural range of biomass under $F_{\text{may}}$) usually falls somewhere between 0.3 to 0.5 of the average unhished abundance (mean $B_{\text{unished}}$) and rarely falls below one quarter of that amount, (i.e., $B_{\text{may}} \geq 0.25$ mean $B_{\text{unished}}$). Rebuilding, or at least a reduced harvest rate, may be required if abundance falls below these levels.

**While $B_{\text{may}}$ may be set based on the averaged unlished abundance ($B_{\text{unished}}$), there are many possible approximations and estimates of mean $B_{\text{unished}}$.** If the necessary data exist, the following standard methodology is the preferred approach:

$$\text{mean } B_{\text{unished}} = \text{mean } R * \text{SPR}(F=0)$$

**note: spawning biomass per recruit (SPR)**

Where mean $R$ is the average estimated recruitment expected under unlished conditions over all reliable years, and SPR($F=0$) is the spawning potential per recruit at zero fishing mortality rate. Alternative reference points based on mean $R$ * SPR($F_{\text{SSS}}$) or reconstruction of mean $B_{\text{unished}}$ from stock-recruitment relationships may also be used. SPR($F=0$) is normally available as part of the calculation leading to determination of $F_{\text{SSS}}, F_{45\%}$ and is equivalent to $F_{100\%}$.

4.3 Determination of ABC: Overfished Threshold, and (Overfished/Rebuilding Threshold) (Previously 5.3)

The Magnuson-Stevens Act as amended in 1996 defines OY as the amount of fish that is prescribed on the basis of MSY from the fishery as reduced by any relevant economic, social, or ecological factors. By this definition, overfishing occurs if a stock is harvested at a level in excess of $F_{\text{may}}$. Moreover, overfished stocks (i.e., those that have declined to below a specified (overfished/rebuilding threshold)) are to be rebuilt to a level that is consistent with producing MSY. In establishing OYs for West Coast groundfish, this FMP utilizes the interim step of calculating ABCs for major stocks or management units (groups of species). **ABC is the MSY harvest level associated with the current stock abundance. Over the long term, if ABCs are fully harvested, the average of the ABCs would be MSY.**

ABC, $F_{\text{may}}$, and overfished/rebuilding stock size threshold cannot be precisely defined for all species, because of the absence of available information for many species managed under the FMP. PREVIOUS SENTENCE MOVED TO START OF 5.1. REMAINDER OF PARAGRAPH MOVED TO 4.4.2. In this FMP, the term "overfishing" is used to denote situations where catch exceeds or is expected to exceed the established ABC or MSY proxy ($F_{\text{may}}$). The term "overfished" describes a stock whose abundance is below its overfished/rebuilding threshold. Overfished/rebuilding thresholds in general, are linked to the same productivity assumptions that determine the ABC levels. The default value of this threshold is 25% of the estimated unlished biomass level or 50% of $B_{\text{may}}$ if known.

PARAGRAPHS THREE OF 5.3, ON SPECIES CATEGORIES, HAS BEEN MOVED TO SECTION 4.1. PARAGRAPHS FOUR OF 5.3, ON THE PRECAUTIONARY THRESHOLD, HAS BEEN MOVED TO SECTION 4.4.1
4.3.1 Determination of ABC (Previously 5.3.1)

4.3.1.1 Stocks with Quantitative Assessments, Category 1 (Previously 5.3.1.1)

The stocks with quantitative assessments are those that have recently been assessed by a catch-at-age analysis. Annual evaluation of the appropriate MSY proxy (e.g., F_{95%}, F_{45%}) for species in this category will require some specific information in the SAFE document. Estimated age-specific maturity, growth, and availability to the fishery (with evaluation of changes over time in these characteristics) are sufficient to determine the relationship between fishing mortality and yield-per-recruit and spawning biomass-per-recruit. The estimated time series of recruitment, spawning biomass, fishing mortality are also required to determine whether recent trends indicate a point of concern. In general, ABC will be calculated by applying F_{95%}, F_{45%} (or F_{40%} or F_{50%} or other established MSY proxy) to the best estimate of current biomass. This current biomass estimate may be for a single year or the average of the present and several future years. Thus, ABC may be intended to remain constant over a period of three or more years. All ABCs will remain in effect until revised, and whether revised or not, will be announced at the beginning of the year along with other specifications. LAST SENTENCE MOVED BACK TO CHAPTER 5.

4.3.1.2 Stocks with ABC Set by Nonquantitative Assessment, Category 2 (Previously 5.3.1.2)

These stocks with ABC set by nonquantitative assessments typically do not have a recent, quantitative assessment, but there may be a previous assessment or some indicators of the status of the stock. Detailed biological information is not routinely available for these stocks, and ABC levels have typically been established on the basis of average historical landings. Typically, the spawning biomass, level of recruitment, or the current fishing mortality rate for Category 2 stocks are unknown. The Council places high priority on improving the information for managing these stocks so that they may be moved to Category 1 status.

4.3.1.3 Stocks Without ABC Values, Category 3 (Previously 5.3.1.3)

Of the 83 groundfish species managed under the FMP, ABC values have been established for only about 25. The remaining species are incidentally landed and usually are not listed separately on fish landing receipts. Information from fishery independent surveys are often lacking for these stocks, because of their low abundance or they are not vulnerable to survey sampling gear. Without an until sufficient quantities of at-sea observer program data are available or surveys of other fish habitats are conducted, it is unlikely that there is a database will be developed in the future for these stocks to sufficient data to upgrade the assessment capability capabilities or to evaluate their overfishing potential. Interim ABC values may be established for these stocks based on qualitative information, including advice from the Council’s advisory entities.

4.4 Precautionary Thresholds and Overfishing Status Determination Criteria (NEW SECTION TITLE)

The National Standard Guidelines define two thresholds that are necessary to maintain a stock at levels capable of producing MSY: the maximum fishing mortality threshold (MFMT) and a minimum stock size threshold (MSST). These two limits are intended for use as benchmarks to decide if a stock or stock complex is being overfished or is in an overfished state. The MFMT and MSST are intrinsically linked through the MSY Control Rule that specifies how fishing mortality or catches could vary as a function of stock biomass in order to achieve yields close to MSY. (PRECEDING WAS MOVED FROM SECTION 4.2)

4.4.1 Determination of Precautionary Thresholds (Previously 5.3.3)

The precautionary threshold is the biomass level at which point the harvest rate will be reduced to help the stock return to the MSY level (see Section 4.5.1 “Default Precautionary and Interim Rebuilding OY Calculation”). The precautionary biomass threshold is in addition to the overfishing and overfished/rebuilding thresholds required under the MSA (MFMT and MSST). The precautionary biomass threshold is higher than the overfished biomass (MSST). Because B_{may} is a longterm average, biomass will by definition be below B_{may} in some years and above B_{may} in other years. Thus,
even in the absence of overfishing, biomass may decline to levels below B_{mey} due to natural fluctuation. By decreasing harvest rates when biomass is below B_{mey}, but maintaining MSY control rule (or proxy control rule) harvest rates for biomass levels above MSY, the precautionary threshold and accompanying response effectively constitute a control rule that manages for harvests lower than MSY and an average biomass above MSY.

The precautionary threshold is established only for category 1 species. The precautionary threshold will be the B_{mey} level, if known. The default precautionary threshold will be 40% of the estimated unfished biomass level. The Council may recommend different precautionary thresholds for any species or species group based on the best scientific information about that species or group. It is expected the threshold will be between 25% and 50% of the estimated unfished biomass level.

For category 1 species, in addition to the overfished/rebuilding threshold, a precautionary threshold is established. The default value will be 40% of mean B_{unfished}. This level of biomass is expected to be near B_{mey}, and if abundance is between the overfished/rebuilding threshold and the precautionary threshold, a precautionary reduction in harvest will be implemented to avoid further declines in abundance. (PRECEDING PARAGRAPH MOVED FROM SECTION 5.3 THEN DELETED AS BEING REDUNDANT WITH EXISTING/NEW TEXT)

4.4.2 Determination of Overfishing Threshold (NEW SECTION)

In this FMP, for Category 1 species, the term "overfishing" is used to denote situations where catch exceeds or is expected to exceed the established ABC or MSY proxy (F_{MSY}). This can also be expressed as where catch exceeds or is expected to exceed the MFMT. The term "overfished" describes a stock whose abundance is below its overfished/rebuilding threshold. Overfished/rebuilding thresholds in general, are linked to the same productivity assumptions that determine the ABC levels. The default value of this threshold is 25% of the estimated unfished biomass level or 50% of B_{mey}, if known. (PRECEDING WAS MOVED FROM SECTION 5.3) The MFMT is simply the value(s) of fishing mortality in the MSY control rule. Technically, exceeding F_{mey} now constitutes overfishing. (PRECEDING WAS MOVED FROM SECTION 5.2)

THE FOLLOWING PARAGRAPHS ON CATEGORY 2 AND CATEGORY 3 SPECIES WERE MOVED FROM SECTION 5.3.6.2.

For Category 2 species, the following may be evaluated as potential indicators of overfishing:
  - catch per effort from logbooks
  - catch area from logbooks
  - index of stock abundance from surveys
  - stock distribution from surveys
  - mean size of landed fish

If declining trends persist for more than three years, then a focused evaluation of the status of the stock, its ABC, and overfishing threshold will be quantified. If data are available, such an evaluation should be conducted at approximately five year intervals even when negative trends are not apparent. In fact, many stocks are in need of re-evaluation to establish a baseline for monitoring of future trends. Whenever an evaluation indicates the stock may be declining and approaching an overfished state, the Council should:

1. Improve data collection for this species so it can be moved to Category 1.

2. Determine the rebuilding rate that would allow the stock to return to MSY in no longer than ten years.

For Category 3 species, information from fishery independent surveys are often lacking for these species because of their low abundance or they are not vulnerable to survey sampling gear. Without an at-sea observer program, it is unlikely that a data base will be developed in the future for these species to evaluate the risk of overfishing.
4.4.3 Determination of Overfished/Rebuilding Thresholds (Previously 5.3.4)

The _MSST (overfished/rebuilding threshold) is the default value of 25% of the estimated unfished biomass level or 50% of B_{mnp} if known_. (PRECEDING WAS MOVED FROM SECTION 4.2) 

As described in section 5.3, the overfished/rebuilding threshold (also referred to as B_{rebuild MSST}) is generally in the range of 25% to 40% of B_{unfished} and may also be written as

\[ B_{rebuild} = x\% \times \text{mean } R \times \text{SPR}(F=0) \]

The default overfished/rebuilding threshold for category 1 groundfish is \(0.25B_{unfished}\). The Council may establish different thresholds for any species based on information provided in stock assessments, the SAFE document, or other scientific or groundfish management-related report. For example, if B_{mnp} is known, the overfished threshold may be set equal to 50% of that amount. The Council may also specify a lower level of abundance where catch or fishing effort is reduced to zero. This minimum abundance threshold (B_{min}) would correspond to an abundance that severely jeopardizes the stock’s ability to recover to B_{mnp} in a reasonable length of time; likely values fall between five percent and ten percent of the average unfished level.

4.5 Ending Overfishing and Rebuilding (New Section Title)

4.5.1 Default Precautionary and Interim Rebuilding OY Calculation (Previously 5.3.5)

The precautionary threshold, defined in Section 4.4.1, is used to trigger a precautionary management approach. If biomass declines to a level that requires rebuilding (below the MSST), the precautionary management approach also provides an interim rebuilding harvest control policy to guide the setting of OY until the Council sets a new rebuilding policy specific to the conditions of the stock and fishery. The default OY/rebuilding plan policy can be described as an "ICES-type catch-based approach" that consists of a modification of the catch policy, where catch (C) declines from C(F_{mnp}) at the precautionary threshold in a straight line to F=0 at the minimum abundance threshold of ten percent of the estimated mean unfished biomass (sometimes called pristine or virgin biomass or reproductive potential). This approach could also be described as an OY based on a variable F_{SPR} that is progressively more conservative at low biomass
levels. The abbreviated name for this is the "40-10" default adjustment. In most cases, there is inadequate information to estimate $F_{\text{may}}$, in such cases, the best proxy for $F_{\text{may}}$ will be used. The default proxy values will be $F_{40\%}$ for flathand and whiting, $F_{50\%}$ for rockfish in the Sebastes complex and $F_{55\%}$ for other species such as sablefish and lingcod. The Council anticipates scientific information about the population dynamics of the various stocks will improve over time and that this information will result in improved estimates of appropriate harvest rates and MSY proxies. Thus, these initial default proxy values will be replaced from time to time. Such changes will not require amendment to the FMP, but the scientific basis for new values must be documented.

The greater amount of catch reduction applied below the precautionary threshold will foster quicker return to the MSY level. If a stock falls below its overfished/rebuilding threshold, this line would be used as the interim rebuilding plan during the year until the Council develops a formal rebuilding plan. The point at which the line intersects the horizontal axis does not necessarily imply zero catch would be allowed, but rather is for determining the slope of the line.

In order to apply this default approach, a minimal amount of information is necessary; only stocks in Category 1 can be managed in this way. For stocks with inadequate information to apply this approach, the Council will consider other methods of ensuring that overfishing will be avoided. The Council will consider the approaches discussed in the National Standard Guidelines in developing such recommendations for stocks in Categories 2 and 3.

4.5.2 Stock Rebuilding Plan Elements and Processes Requirements (Previously 5.3.6)

As required by the Magnuson-Stevens Act within one year of being notified by the Secretary that a stock is overfished or approaching a condition of being overfished, the Council will prepare a recommendation to end the overfished condition and rebuild the stock(s) or to prevent the overfished condition from occurring.

A new rebuilding plan or revision to an existing rebuilding plan proposed by the Council will be submitted to the Secretary-

**OPTION 1a-** as a policy document to accompany the annual management recommendations developed as part of the regular annual management process (see Chapter 5).

**OPTION 1b-** as a policy statement accompanying a groundfish FMP amendment specifying the target rebuilding time, best estimate of $B_{\text{may}}$ and other elements specifically required under the MSA; management regulations designed to achieve the harvest control rules developed as part of the regular annual management process (see Chapter 5).

**OPTION 1c OR 1e-** an FMP amendment and management regulations designed to achieve the harvest control rules developed as part of the regular annual management process (see Chapter 5).

**OPTION 1d OR 1f-** a regulatory amendment and management regulations designed to achieve the harvest control rules developed as part of the regular annual management process (see Chapter 5).

along with annual management recommendations as part of the regular annual management process. THE FOLLOWING SENTENCE IS INSECTION 4.5.2.3. Once approved by the Secretary, a rebuilding plan will remain in effect for the specified duration of the rebuilding program, or until modified. The Council will also make all approved rebuilding plans available in the annual SAFE document or by other means. The Council may recommend the Secretary implement interim measures to reduce overfishing until the Council’s program has been developed and implemented.

The Council intends its stock rebuilding plans to provide targets, checkpoints and guidance for rebuilding overfished stocks to healthy and productive levels. The rebuilding plans themselves will not be
regulations but principles and policies: They are intended to provide a clear vision of the intended results and the means to achieve those results. They will provide the strategies and objectives that regulations are intended to achieve, and proposed regulations and results will be measured against the rebuilding plans. It is likely that rebuilding plans will be revised over time to respond to new information, changing conditions and success or lack of success in achieving the rebuilding schedule and other goals. As with all Council activities, public participation is critical to the development, implementation and success of management programs.

In order to facilitate implementation of rebuilding plans in a fair and equitable manner, the Council made the following allocational decisions as part of Amendment 12 to the FMP:

THE FOLLOWING TWO PROVISIONS WERE PREVIOUSLY PART OF SECTION 4.6.

(1) For any stock that has been declared overfished, the open access/limited entry allocation shares may be temporarily revised for the duration of the rebuilding period by amendment to the regulations in accordance with the normal allocation process described in this FMP. However, the Council may at any time recommend the shares specified in chapter 12 of this FMP be reinstated without requiring further analysis. Once reinstated, any change may be made only through the allocation process.

(2) For any stock that has been declared overfished, any vessel with a limited entry permit may be prohibited from operating in the open access fishery when the limited entry fishery has been closed.

4.5.2.1 Goals and Objectives of Rebuilding Plans (Previously 5.3.6.1)

The overall goals of rebuilding programs are to (1) achieve the population size and structure that will support the maximum sustainable yield within the specified time period; (2) minimize, to the extent practicable, the social and economic impacts associated with rebuilding, including adverse impacts on fishing communities; (3) fairly and equitably distribute both the conservation burdens (overfishing restrictions) and recovery benefits among commercial, recreational and charter fishing sectors; (4) protect the quantity and quality of habitat necessary to support the stock at healthy levels in the future; and (5) promote widespread public awareness, understanding and support for the rebuilding program. More specific goals and objectives may be developed in the rebuilding plan for each overfished species.

To achieve the rebuilding goals, the Council will strive to (1) explain the status of the overfished stock, pointing out where lack of information and uncertainty may require that conservative assumptions be made in order to maintain a risk-averse management approach; (2) identify present and historical harvesters of the stock; (3) where adequate harvest sharing plans are not already in place, develop harvest sharing plans for the rebuilding period and for when rebuilding is completed; (4) set harvest levels that will achieve the specified rebuilding schedule; (5) implement any necessary measures to allocate the resource in accordance with harvest sharing plans; (6) promote innovative methods to reduce bycatch and bycatch mortality of the overfished stock; (7)

OPTIONS 2a, 2b, 2c, OR 2d: monitor fishing mortality and, using available stock assessment information, the condition of the stock at least every two years to ensure the goals and objectives are being achieved (see Section 4.5.2.4 for additional details);

OPTION 2e: monitor fishing mortality annually and the condition of the stock at least every two years and compare stock biomass with respect to that expected under the rebuilding harvest control rules each time a new stock assessment is provided to ensure the goals and objectives are being achieved;

(8) identify any critical or important habitat areas and implement measures to ensure their protection; and (9) promote public education regarding these goals, objectives and the measures intended to achieve them.

(THIS PARAGRAPH WAS PREVIOUSLY THE FIRST PARAGRAPH OF 5.3.6.2)
4.5.2.2 Contents of Rebuilding Plans (Previously 5.3.6.2 (corrected from 5.6.3.2))

FIRST PARAGRAPH OF 5.6.3.2 MOVED TO 4.5.2.1 (PREVIOUSLY 5.3.6.1)

The rebuilding plan for overfished species will specify any individual rebuilding goals and objectives for that species, including: a time period for ending the overfished condition and rebuilding the stock and the target biomass to be achieved; insert list of required elements based on council recommendations from issue 1, including specification of whether the element is to be part of a policy document, FMP, or regulation, and whether the element is to be a fixed value or a formula/algorithm/table which will be used to update the value as new information becomes available. OPTION 2c: A schedule for stock assessments will be specified in the rebuilding plan and driven by the stock dynamics (more frequent reviews and assessments will be conducted for more productive stocks). That schedule will specify an increase in the frequency of stock assessments and rebuilding plan reviews as Tmax draws closer. OPTION 3d: Each rebuilding plan will be required to include a specific standard for determining when progress has been adequate. Based on the council's final recommendations on issue 1, adjust the following two sentences to indicate which, if any, of the following will be required to be part of an FMP amendment or regulation. The rebuilding plan will explain how the rebuilding period was determined, including any calculations that demonstrate the scientific validity of the rebuilding period. The plan will identify potential or likely allocations among sectors, identify the types of management measures that will likely be imposed to ensure rebuilding in the specified period, and provide other information that may be useful to achieve the goals and objectives. The following sentence was moved from section 4.6. For fisheries managed under an international agreement, council rebuilding plans must reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.

The Council may consider a number of factors in determining the time period for rebuilding, including:

1. The status and biology of the stock or stock complex.
2. Interactions between the stock or stock complex and other components of the marine ecosystem or environmental conditions.
3. The needs of fishing communities.
4. Recommendations by international organizations in which the United States participates.
5. Management measures under an international agreement in which the United States participates.

The lower limit of the specified time period for rebuilding will be determined by the status and biology of the stock or stock complex and its interactions with other components of the marine ecosystem or environmental conditions and is defined as the amount of time that would be required for rebuilding if fishing mortality were eliminated entirely.

If the lower limit is less than ten years, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment may result in the specified time period exceeding ten years, unless management measures under an international agreement in which the United States participates dictate otherwise.

If the lower limit is ten years or greater, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment can exceed the rebuilding period calculated in the absence of fishing mortality, plus one mean generation time or equivalent period based on the species' life-history characteristics. For example, if a stock could be rebuilt within 12 years in the absence of any fishing mortality, and has a mean generation time of eight years, the rebuilding period could be as long as 20 years.
THE FOLLOWING SENTENCE WAS MOVED FROM SECTION 4.6. *Any new rebuilding program will commence as soon as the first measures to rebuild the stock or stock complex are implemented.*

**Rebuilding target control rules for individual species may include:** constant catch strategy - where catch is held constant over time until the stock reaches B_{MSY}; a constant fishing mortality rate - where a constant proportion of the stock is removed annually until the stock reaches B_{MSY}; or a combination of these strategies.

The rebuilding plan will also consider the following possible measures to promote rebuilding: Based on council final recommendations from issue 1 insert list of the rebuilding actions that rebuilding plans are required to consider, if any (as opposed to required to include).

The Council will also consider the following questions in developing rebuilding plans.

1. What is the apparent cause of the current condition (historical fishing patterns, a declining abundance or recruitment trend, a change in assessment methodology, or other factors)?
2. Is there a downward trend in recruitment that may indicate insufficient compensation in the spawner-recruitment relationship?
3. Based on an comparison of historical harvest levels (including discards) relative to recommended ABC levels, has there been chronic over harvest?
4. Is human-induced environmental degradation implicated in the current stock condition? Have natural environmental changes been observed that may be affecting growth, reproduction, and/or survival?
5. Would reduction in fishing mortality be likely to improve the condition of the stock?
6. Is the particular species caught incidentally with other species? Is it a major or minor component in a mixed-stock complex?
7. What types of management measures are anticipated and/or appropriate to achieve the biological, social, economic and community goals and objectives of the rebuilding plan?

THE FOLLOWING SECTIONS ON CATEGORY 2 AND 3 WERE MOVED TO SECTION 4.4.2.

For Category 2 species, the following may be evaluated as potential indicators of overfishing:

- catch per effort from logbooks
- catch area from logbooks
- index of stock abundance from surveys
- stock distribution from surveys
- mean size of landed fish

If declining trends persist for more than three years, then a focused evaluation of the status of the stock, its ABC, and overfishing threshold will be quantified. If data are available, such an evaluation should be conducted at approximately five year intervals even when negative trends are not apparent. In fact, many stocks are in need of re-evaluation to establish a baseline for monitoring of future trends. Whenever an evaluation indicates the stock may be declining and approaching an overfished state, the Council should:

1. Improve data collection for this species so it can be moved to Category 1.

2. Determine the rebuilding rate that would allow the stock to return to MSY in no longer than ten years.

For Category 3 species, information from fishery independent surveys are often lacking for these species because of their low abundance or they are not vulnerable to survey sampling gear. Without an at-sea observer program, it is unlikely that a database will be developed in the future for these species to evaluate the risk of overfishing.
4.5.2.3. Process for Development and Approval of Rebuilding Plans (Previously 5.3.6.3, corrected from 5.6.3.3)

The Rebuilding Plan

Upon receiving notification that a stock is overfished, the Council will identify one or more individuals to draft the rebuilding plan. If possible, the Council will schedule review and adoption of the proposed rebuilding plan to coincide with the annual management process. 

**OPTION 1b: The rebuilding plan will be developed as a single policy document that will contain within it or be accompanied by an FMP amendment to (1) implement any rebuilding actions required under Section 304(e) of the MSA that are not already authorized under the existing FMP, (2) specify in the FMP the rebuilding period required under Section 304(e)(4)(A) of the MSA, and (3) specify the following additional measures as part of the FMP (INSERT LIST OF ELEMENTS REQUIRED TO BE PART OF A REBUILDING FMP AMENDMENT AS SPECIFIED BY THE COUNCIL IN ITS FINAL DECISION ON ISSUE 1, SEE SECTION 2 OF THE MAIN TEXT OF THIS DOCUMENT). For portions of the rebuilding plan to be implemented in the form of an FMP, the proposed actions will meet the standard procedural and analytical requirements for considering and implementing FMP amendment under the MSA and other applicable law.** OPTIONS 1a AND 1b: A draft of the rebuilding plan will be reviewed and preliminary action taken (tentative adoption or identification of preferred alternatives), followed by final adoption at a subsequent meeting. The tentative plan or alternatives will be made available to the public and considered by the Council at a minimum of two meetings unless stock conditions suggest more immediate action is warranted. Upon completing its final recommendations, the Council will submit the proposed rebuilding plan or revision to an existing plan to NMFS for concurrence. In most cases, this will be concurrent with its recommendations for annual management measures. OPTIONS 1c AND 1e (REPLACE PREVIOUS THREE SENTENCES WITH THE FOLLOWING): A rebuilding plan will be developed following the standard procedures for considering and implementing an FMP amendment under the MSA and other applicable law. OPTIONS 1d AND 1f (REPLACE PREVIOUS THREE SENTENCES WITH THE FOLLOWING): A rebuilding plan will be developed following the standard procedures for implementing a regulatory amendment under the MSA and other applicable law.

FOLLOWING PARAGRAPH WAS MOVED FROM THE END OF THE SECTION TO THIS POSITION.

OPTIONS 1a AND 1b: NMFS will review the Council’s recommendations and supporting information upon receipt and may approve, disapprove, or partially approve each rebuilding plan. The Council will be notified in writing of the NMFS decision. If NMFS does not concur with the Council’s recommendation, reasons for the disapproval will be included in the notification. FOR OPTIONS 1c, 1d, 1e, AND 1f, DELETE THE PREVIOUS THREE SENTENCES. Once approved, a rebuilding plan will remain in effect for the length of the specified rebuilding period or until revised (i.e. stock reaches target biomass).

Implementation of Actions Required Under the Rebuilding Plan

MOVED FROM MIDDLE OF FIRST PARAGRAPH OF THIS SECTION

**Once a rebuilding plan is established, certain measures required in the rebuilding plan may need to be implemented through authorities and processes already established in the FMP. Management actions to achieve QY harvest and objectives related to rebuilding, requirements of the MSA and goals and objectives of the FMP (each of which may require a slightly different process) include: automatic actions, notices, abbreviated rulemaking actions, and full rulemaking actions (these actions are detailed at-in Section 4.6, Chapter 5 and Section 6.2). Allocation proposals require consideration at a minimum of three Council meetings, as specified in the allocation framework. In addition, any proposed regulations, to implement the rebuilding plan will be developed in accordance with the framework procedures of this FMP. (ORDER OF LAST TWO SENTENCES SWITCHED)**

Any rebuilding management measures that are not already authorized under the framework of the existing FMP will be implemented through a plan amendment process. The plan amendment may
establish the needed measures or expand the framework to allow the implementation of the needed measures under framework procedures.

The Council may designate a state or states to take the lead in working with its citizens to develop management plans to achieve the rebuilding. (MOVED FROM FIRST PARAGRAPH OF THIS SECTION ON "IMPLEMENTATION OF ACTIONS . . . ")

4.5.2.4 Process for Review and Update of Rebuilding Plans OPTIONS 2c AND 2d: and Schedule for Stock Assessments for Overfished Stocks (New section title inserted)

(FOLLOWING WAS PREVIOUSLY PART OF 5.3.6.3)

OPTION 2a (STATUS QUO): Rebuilding plans will be reviewed periodically, at least every 2 years and the Council may propose revisions to existing plans at any time although in general this will occur only during the annual management process. in accordance with the amendment process appropriate for the form of the plan (DETERMINED UNDER ISSUE 1). Rebuilding plans will be reviewed with respect goals 1-5 defined in Section 4.5.2.1 of the FMP. Any revisions to a rebuilding plan must also be approved by NMFS.

OPTION 2b, 2c, AND 2d: Rebuilding plans will be reviewed periodically, at least every 2 years and the Council may propose revisions to existing plans at any time although in general this will occur only during the annual management process. in accordance with the amendment process appropriate for the form of the rebuilding plan (AS DETERMINED BY THE COUNCIL’S FINAL RECOMMENDATION WITH RESPECT TO ISSUE 1). Rebuilding plans will be reviewed with respect to goal 1 Section 4.5.2.1 of the rebuilding plan only when new stock assessment information is available. All other reviews will assess progress only with respect goals 2-5 defined in Section 4.5.2.1 of the FMP. Any revisions to a rebuilding plan must also be approved by NMFS. SUBOPTION (i): The rebuilding plan will be amended when information in the stock assessment or rebuilding analyses are updated or progress toward rebuilding has not been adequate. SUBOPTION (ii) The rebuilding plan will be amended when new information indicates there has been a significant change in the rebuilding parameters specified in the plan or progress toward rebuilding has not been adequate. The Council will consult with the SSC or GMT in determining whether a change is significant. SUBOPTION (iii) The rebuilding plan will be amended when progress toward rebuilding has not been adequate.

OPTION 2c (ADD THE FOLLOWING TEXT TO THE PREVIOUS PARAGRAPH): A schedule for stock assessments will be specified in the rebuilding plan and driven by the stock dynamics (more frequent reviews and assessments will be conducted for more productive stocks). That schedule will specify an increase in the frequency of stock assessments and rebuilding plan reviews as T_{target} draws closer.

OPTION 2d (ADD THE FOLLOWING TEXT TO THE PREVIOUS PARAGRAPH): Stock assessments will be conducted once every 2 years when T_{max} is less than 20 years away and at least every 4 years when T_{max} is 20 or more years away.

OPTION 2e: Rebuilding plans will be reviewed periodically, at least every 2 years, and the Council may propose revisions to existing plans at any time, although in general this will occur only during the annual management process. Any revisions to a rebuilding plan must also be approved by NMFS. The Council will track harvest mortality in comparison to the harvest mortality goals under the rebuilding plan each year and will assess progress in rebuilding the stock biomass to the MSY level whenever new stock assessments are produced. Information in the Council SAFE document is expected to assist the Secretary in conducting the two year Secretarial reviews of progress under rebuilding plans. A draft of any Secretarial review will be provided to allow an opportunity for Council comment prior to the time the Secretarial review is finalized. SUBOPTION (i): The rebuilding plan will be amended when information in the stock assessment or rebuilding analyses are updated or progress toward rebuilding...
has not been adequate. SUBOPTION (ii) The rebuilding plan will be amended when new information indicates there has been a significant change in the rebuilding parameters specified in the plan or progress toward rebuilding has not been adequate. The Council will consult with the SSC or GMT in determining whether a change is significant. SUBOPTION (iii) The rebuilding plan will be amended when progress toward rebuilding has not been adequate.

OPTIONS 2b, 2c, 2d, AND 2e: The Council's annual SAFE document will provide (1) the most recent information available on the best estimate of total fishing mortality as compared to target fishing mortality levels pursuant to the rebuilding plan; (2) the most recent assessment of stock size compared to the expected stock size for the rebuilding trajectory; (3) information on allocation and the social and economic status of the fishery.

OPTION 3b: If an updated stock projection indicates that the stock is below the rebuilding level projected under the original rebuilding plan then progress will be considered inadequate and an adjustment to the rebuilding plan must be made.

OPTION 3c: Progress of rebuilding plans with respect to goal 1 of Section 4.5.2.1 will be deemed in adequate if an updated stock projection indicates that the stock does not have at least a 50% probability of rebuilding in the maximum time \(T_{\text{max}}\), then progress will be considered inadequate. In such a case, harvest strategy must be adjusted to increase the probability of rebuilding within the maximum time to at least 50%. Other needed adjustments to the rebuilding plan will also be considered.

OPTION 4b: ADD THE FOLLOWING AS A NEW SECTION

Section 4.5.2.5 Incorporation of ESA Jeopardy Standards or Recovery Plans (New Section)

A jeopardy standard or recovery plan for an overfished stock listed under the ESA will supersede the rebuilding plan for the overfished species until such time as the stock is no longer listed. If a stock is delisted, the rebuilding plan will come back into effect until such time as the stock is fully rebuilt. After delisting, an amendment to the rebuilding plan may be necessary to take into account the revised status and information on the overfished stock.

4.6 Determination of OY (Previously 5.3.2)

THE FOLLOWING FIVE PARAGRAPHS PREVIOUSLY COMPRISED THE ENTIREITY OF CHAPTER 4

Optimum yield (OY) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as the amount of fish which will provide the greatest overall benefit to the Nation. The Magnuson-Stevens Act also specifies that OY is based on maximum sustainable yield (MSY), and may be equal to or less than MSY. The fishery management plan (FMP) authorizes establishment of a numerical or non-numerical OY for any groundfish species or species group and lays out the procedures the Council will follow in determining appropriate numerical OY values. An OY may be specified for the fishery management area as a whole or for specific subareas. Numerical OYs will be specified annually, based on acceptable biological catches (ABCs) for major species or species groups, which are in turn based on quantitative or qualitative stock assessments. "Control rules" for determining the numerical values of OYs ensure they will not exceed the ABCs except under tightly limited conditions.

Most of the 83 species managed by the FMP have never been assessed in either a quantitative or qualitative manner. In some cases even basic catch statistics are unavailable, because many species (rockfish, for example) are not sorted unless specifically required by regulation. Species of this type have generally not been subject to numerical harvest limits, but rather harvest is limited by gear restrictions and market demand. Other management measures which determine the total amount of harvest each year include trip landing and frequency limits. Those species without a specified OY and not included in a multi-species OY will be included
in a non-numerical OY, which is defined as all the fish that can be taken under the regulations, specifications, and management measures authorized by the FMP and promulgated by the U.S. Secretary of Commerce. This non-numerical OY is not a predetermined numerical value, but rather the harvest that results from regulations, specifications, and management measures as they are changed in response to changes in the resource and the fishery. In many cases, the absence of a numerical specification reflects the absence of basic management information, such as abundance estimates and catch statistics. The non-numerical OY concept allows for a variable amount of groundfish to be harvested annually, limited by such constraints as gear restrictions, management measures for other species, and/or absence of consumer acceptance or demand.

The close spatial relationship of many groundfish species throughout the management area results in commercial and recreational catches often consisting of mixtures of several species. This is especially the case in the trawl fishery where fishermen may target on one species, but unavoidable harvest several other species. In such cases, the optimum harvest strategy often is to target on a group (complex or assemblage) of groundfish species. The grouping of groundfish species into multispecies numerical and non-numerical OYs provides the flexibility to manage to obtain the optimum public benefit from the groundfish fishery as a whole rather than the maximum yield from each species. In other cases, single species management may be necessary to provide adequate resource protection, bycatch controls, or equitable allocation. In such cases, the Council may determine it more appropriate to use individual species management by means of quotas, harvest guidelines, allocations by gear type, and other management measures.

Managing multiple species complexes for OY from the complex as a whole necessarily may result in some degree of overfishing or failure to allow recovery to the MSY level for some individual stocks. The Council will strive, to the extent practicable, to avoid overfishing individual stocks and control harvest mortality to allow overfished stocks to rebuild or preventing a stock from recovering to the MSY level. In the event the Council determines that greater long-term benefits will be gained from the groundfish fishery by overfishing individual stocks or by preventing a stock from recovering to its MSY level, it will justify the action in writing in accordance with the procedures and standards identified in this section and Section 600.310 of the National Standard Guidelines, in Section 5.3.6 (Stock Rebuilding) or in Section 5.5 (Annual Implementation Procedures for Specifications and Apportionments). Conversely, the Council may determine that greater benefits will accrue from protecting an individual stock by constraining the multiple species complex or specific components of that complex.

Prior to implementation of the FMP in 1982, the states of Washington, Oregon, and California managed the groundfish fishery without the use of quotas. State regulations since the mid-1940s took the form of area closures (such as San Francisco Bay), legal gear definitions, minimum codend mesh regulations, size limits, bag limits, and other nonquota management measures. Implementation of the FMP built upon those historical management practices by increasing the level of catch monitoring, improving the assessment of stock conditions, and establishing other mechanisms for responding to management needs. It provides for continuation of the historical fishery on traditionally harvested groundfish species while allowing for the development of new fisheries for underutilized species. The FMP, as amended, provides for the establishment of resource conservation measures such as harvest guidelines or quotas through the annual specification procedure and annual and inseason management measures through the "points of concern" and socioeconomic framework mechanisms.

THE REMAINDER OF THIS SECTION PREVIOUSLY COMPRISSED THE ENTIRETY OF SECTION 5.3.2 EXCEPT AS NOTED.

Reduction in catches or fishing rates for either precautionary or rebuilding purposes is an important component of converting values of ABC to values of OY. This relationship is specified by the harvest control rule. All OYs will remain in effect until revised, and, whether revised or not, will be announced at the beginning of the year along with other specifications (see Chapter 5).

Groundfish stock assessments generally provide the following information to aid in determination of ABC and
1. Current biomass (or and reproductive potential) estimate.

2. F_{\text{may}} or proxy, translated into exploitation rate.

3. Estimate of MSY biomass (B_{\text{may}}), or proxy, unflushed biomass (based on average recruitment), precautionary threshold, and/or overflushed/rebuilding threshold.

4. Precision estimate (e.g., confidence interval) for current biomass estimate.

**Determination of Numerical OYs If Stock Assessment Information Is Available (Category 1)**

The Council will follow these steps in determining numerical OYs. The recommended numerical OY values will include any necessary adjustments to harvest mortality needed to rebuild any stock determined to be below its overflushed/rebuilding threshold and may include adjustments to address uncertainty in the status of the stock.

1. ABC: Multiply the current fishable biomass estimate times the F_{\text{may}} exploitation rate or its proxy to get ABC.

2. Precautionary adjustment: If the abundance is above the specified precautionary threshold, OY may be equal to or less than ABC. If current biomass estimate is less than the precautionary threshold (Section 4.4.1), the harvest rate will be reduced according to the harvest control rule specified in Section 4.5.1 in order to accelerate a return of abundance to optimal levels. If the abundance falls below the overflushed/rebuilding threshold (Section 4.4.2), the harvest control rule will generally specify a greater reduction in exploitation as an interim management response toward rebuilding the stock while a formal rebuilding plan is being developed. The rebuilding plan will include a specific harvest control rule designed to rebuild the stock, and that control rule will be used in this stage of the determination of OY.

3. Uncertainty adjustments: In cases where there is a high degree of uncertainty about the biomass estimate and other parameters, OY may be further reduced accordingly.

4. Other adjustments to OY: Adjustments to OY for other social, economic, or ecological considerations may be made. There will be, including reductions for anticipated bycatch mortality (i.e. mortality of discarded fish), may be made. Amounts of fish harvested as compensation for private vessels participating in NMFS resource survey activities will also be deducted from ABC prior to setting OY.

5. OY recommendations will be consistent with established rebuilding plans and achievement of their goals and objectives unless otherwise adjusted in accordance with section 6 below.

(a) In cases where overfishing is occurring, Council action will be sufficient to end overfishing.

(b) In cases where a stock or stock complex is overfished, Council action will specify **OY in a manner that complies with rebuilding plans developed in accordance with Section 4.5.2.** THE FOLLOWING IS ELIMINATED BECAUSE IT DUPLICATES PROVISIONS OF SECTION 4.5.2. a time period for rebuilding the stock or stock complex that satisfies the requirements of section 304(e)(4)(A) of the Magnuson-Stevens Act.

(i) The Council will consider a number of factors in determining the time period for rebuilding:

(i) The status and biology of the stock or stock complex:

(2) Interactions between the stock or stock complex and other components of the marine ecosystem (also referred to as “other environmental conditions”):

(3) The needs of fishing communities:

(4) Recommendations by international organizations in which the United States participates:

(5) Management measures under an international agreement in which the United States
participates:

(ii) These factors enter into the specification of the time period for rebuilding as follows:

(1) The lower limit of the specified time period for rebuilding is determined by the status and biology of the stock or stock complex and its interactions with other components of the marine ecosystem and is defined as the amount of time that would be required for rebuilding if fishing mortality were eliminated entirely.

(2) If the lower limit is less than ten years, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates; except that no such upward adjustment can result in the specified time period exceeding ten years, unless management measures under an international agreement in which the United States participates dictate otherwise.

(3) If the lower limit is ten years or greater, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates; except that no such upward adjustment can exceed the rebuilding period calculated in the absence of fishing mortality, plus one mean generation time of equivalent period based on the species’ life-history characteristics. For example, suppose a stock could be rebuilt within twelve years in the absence of any fishing mortality, and has a mean generation time of eight years. The rebuilding period, in this case, could be as long as 20 years.

PARAGRAPH (iii) WAS MOVED TO SECTION 4.5.2.2.

(iii) Any new rebuilding program will commence as soon as the first measures to rebuild the stock or stock complex are implemented.

PARAGRAPH (iv) IS ELIMINATED BECAUSE THERE ARE NO PRE-EXISTING REBUILDING PLANS.

(iv) Any pre-existing rebuilding plans will be reviewed to determine whether they are in compliance with all requirements of the Magnuson-Stevens Act. (Note: Only Pacific ocean perch falls into this category.)

(c) For fisheries managed under an international agreement, Council action must reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.

(d) For any stock that has been declared overfished, the open access/limited entry allocation shares may be temporarily revised for the duration of the rebuilding period by amendment to the regulations in accordance with the normal allocation process described in this FMP. However, the Council may at any time recommend the shares specified in chapter 12 of this FMP be reinstated without requiring further analysis. Once reinstated, any change may be made only through the allocation process.

(e) For any stock that has been declared overfished, any vessel with a limited entry permit may be prohibited from operating in the open access fishery when the limited entry fishery has been closed.

6. Adjustments to OY could include increasing OY above the default value up to the overfishing level as long as the management still allows achievement of established rebuilding goals and objectives. In limited circumstances, these adjustments could include increasing OY above the overfishing level as long as the harvest meets the standards of the mixed stock exception in the National Standard Guidelines:

(a) The Council demonstrates by analysis that such action will result in long-term net benefits to the Nation.

(b) The Council demonstrates by analysis that mitigating measures have been considered and that a similar level of long-term net benefits cannot be achieved by modifying fleet behavior, gear selection configuration, or other technical characteristic in a manner such that no overfishing would occur.

(c) The resulting rate or level of fishing mortality will not cause any species or evolutionarily significant unit thereof to require protection under the Endangered Species Act.

7. For species complexes (such as Sebastes complex), the OY will generally be set equal to the sum of the individual component ABCs, HGs, and/or OYs, as appropriate.
Determination of a Numerical OY If ABC Is Based on Nonquantitative Assessment (Category 2)

1. ABC may be based on average of past landings, previous nonquantitative assessment, or other qualitative information.

2. Precautionary adjustments, if any, would be based on relevant information. In general, the Council will follow a risk-averse approach and may recommend an OY below ABC if there is a perception the stock is below its MSY biomass level. If a declining trend persists for more than three years, then a focused evaluation of the status of the stock, its ABC, and the overfishing parameters will be quantified. If data are available, such an evaluation should be conducted at approximately five-year intervals even when negative trends are not apparent. In fact, many stocks are in need of re-evaluation to establish a baseline for monitoring of future trends. Whenever an evaluation indicates the stock may be declining and approaching an overfished state, then the Council should:
   a. Recommend improved data collection for this species.
   b. Determine the rebuilding rate that would increase the multispecies value of the fishery.

3. Uncertainty adjustment: In cases where there is a high degree of uncertainty about the condition of the stock or stocks, OY may be reduced accordingly.

4. Amounts of fish harvested as compensation for industry research activities will also be deducted.

5. These adjustments could include increasing OY above the default value as indicated for Category 1 stocks, items 5 and 6 above.

Non-numerical OY for Stocks with No ABC Values (Category 3)

Fish of these species are incidentally landed and usually are not listed separately in fish landing receipts. Information from fishery-independent surveys are often lacking for these stocks, because of their low abundance or they are not vulnerable to survey sampling gear. Until sufficient quantities of Without an at-sea observer program data are available or surveys of other fish habitats are conducted and/or requirements that landings of all species be recorded separately, it is unlikely that there a data base will be developed in the future for these stocks to sufficient data to upgrade the assessment capability capabilities or to evaluate their overfishing potential.

These species typically may be included in a non-numerical OY that is defined as all the fish that can be taken under the regulations, specifications, and management measures authorized by the FMP and promulgated by the Secretary. Such an OY may not be a predetermined numerical value, but rather that harvest that results from regulations, specifications, and management measures as they are changed in response to changes in the resource and the fishery. Nothing in this FMP prevents inclusion of these species in a numerical OY if the Council believes that is more appropriate.
5.0 **ANNUAL 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, 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 between September and November, 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.

This chapter describes the steps in this process.

### 5.1 General Overview of Annual Specifications Process

(New Section, text moved from introduction to Chapter 5)

The annual specification 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<sub>x%</sub>) and ABC will be the F<sub>x%</sub> applied to the current biomass estimate. **The MSY is the maximum long-term average yield expected from annual application of the MSY (or proxy) harvest policy under prevailing ecological and environmental conditions.**

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. **For any stock or stock complex where the Secretary identifies that overfishing is occurring the Council will take remedial action to end overfishing. For any stock or stock complex the Secretary has identified as approaching the overfished condition the Council will take remedial action to prevent the stock or stock complex from falling below the minimum stock size threshold or from fishing.** 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 implement such annual management measures as are necessary to rebuild the stock through control harvest mortality, habitat impacts or other effects of fishing activities that are subject to regulation under this annual process. 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.

5.2 SAFE Document (Previously 5.1)

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. **(The Council anticipates scientific information about the population dynamics of the various stocks will improve over time and that this information will result in**
improved estimates of appropriate harvest rates and MSY proxies. Thus, initial default proxy values will be replaced from time to time. Such changes will not require amendment to the FMP, but the scientific basis for new values must be documented.) COPIED FROM 4.5.

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 the maximum fishing mortality threshold (MFMT) and the minimum stock size threshold (MSST) for each stock or stock complex, along with other information the Council may use to determine whether overfishing is occurring or a stock or stock complex is overfished. (The default overfished/rebuilding threshold for category 1 groundfish is .25B unfished. The Council may establish different thresholds for any species based on information provided in stock assessments, the SAFE document, or other scientific or groundfish management-related report.) PREVIOUS TWO SENTENCES COPIED FROM 4.4.2

11. 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.

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

The preliminary stock assessment section of the 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 stock assessment and fishery evaluation section of the SAFE document available to the public by such means as mailing lists or newsletters and will provide copies upon request. A final The fishery evaluation section of the SAFE may be prepared after the Council has made its final recommendations for the upcoming year and will include the final recommendations, an estimate of the previous year’s catch, and including summaries of proposed and pre-existing rebuilding plans. The final SAFE document, if prepared, will also and be made available upon request.

5.3 Authorization and Accounting for Fish Taken as Compensation for Authorized Scientific Research Activities. (Previously 5.4)

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 after the fish are harvested. During the annual specification process, NMFS will announce the total amount of fish caught during the year as compensation for conducting a resource survey, which then will be deducted from the following year's ABCs in setting the OYs.

5.4 Annual Implementation Procedures for Specifications and Apportionments (Previously 5.6)

Annually, 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 Council meetings. In addition during this process, the Council may recommend establishment of HGs and quotas for species or species groups within an OY.

The Council will develop preliminary recommendations at the first of the two meetings (usually in August or 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 October or 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 report and consider public testimony before adopting final recommendations to the Secretary. 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. All ABCs, OYs, and any HGs or quotas will remain in effect until revised, and, whether revised or not, will be announced at the beginning of the year along with other specifications. PREVIOUS SENTENCE MOVED FROM 5.3.1.1.

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, the current specifications in effect at the end of the previous fishing year will remain in effect until modified, superseded, or rescinded.
5.5 Inseason Procedures for Establishing or Adjusting Specifications and Apportionments (Previously 5.7)

5.5.1 Inseason Adjustments to ABCs

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 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 at the earliest possible date.

5.5.2 Inseason Establishment and Adjustment of OYs, HGs, and Quotas

OYs and HGs may be established and adjusted inseason (1) for resource conservation through the "points of concern" framework described in Chapter 6; (2) in response to a technical correction to ABC described above; or, (3) under the socioeconomic framework described in Chapter 6.

Quotas, except for apportionments to DAH, DAP, JVP, TALFF, and reserve, may be established and adjusted inseason only for resource conservation or in response to a technical correction to ABC.
REBUILDING PLANS FOR

A. DARKBLOTCHED ROCKFISH
B. PACIFIC OCEAN PERCH
C. COWCOD

VOLUME II

AMENDMENT 16 TO THE GROUNDFISH FISHERY MANAGEMENT PLAN

PACIFIC FISHERY MANAGEMENT COUNCIL
JUNE 2002
a. Policy Document. require as an element of a policy document 
F = FMP Amendment, require as an element of an FMP 
R = Regulatory Amendment, require as an element of a regulatory amendment. 
X = Do not include as an element of a rebuilding document 

b. $T_{target}$ - The number of years in which fishery managers will try to rebuild the stock. 

c. $B_{MSY}$ or proxy - MSY stock size, the long-term average size of the stock or stock complex... that would be achieved under an MSY control rule (50 CFR Ch. VI, Section 600.310 paragraph (b)(1)(iii))

d. Status quo (no action) would maintain $B_{MSY}$ and $T_{target}$ as the only required parameters for rebuilding plans (see Table 2.1-a). 

e. Probability of achieving $B_{MSY}$ within $T_{target}$ years 

f. Where catch is held constant over time until the stock reaches $B_{MSY}$. 

g. Where a constant proportion of the stock is removed annually until the stock reaches $B_{MSY}$. 

h. A combination of the constant catch and constant F strategy. 

i. $P_{target}$ is the probability of achieving $T_{target}$. If $T_{target}$ is the median of the rebuilding times modeled for the F associated with the rebuilding harvest control rule, then $P_{target}$ is 50%. Given that $T_{target}$ is set less than or equal to $T_{max}$, a $P_{target}$ of 50% implies a probability or rebuilding within $T_{max}$ of greater than or equal to 50%. While $P_{target}$ is not a required element under MSA, $T_{target}$ is a required element and constraint on Council/Secretary action, however, $T_{target}$ can act as an effective constraint only when a standard is set with respect to the probability of achieving $T_{target}$. 

j. Probability of achieving $B_{MSY}$ within $T_{max}$ years. If the estimate of $P_{max}$ falls below 50% adjustment to the rebuilding plan may be required (see issue 3).