AMENDMENT 23

CONSIDERATIONS FOR A NEW HARVEST SPECIFICATION FRAMEWORK THAT INCORPORATES REVISED NATIONAL STANDARD 1 GUIDELINES TO PREVENT OVERFISHING

Environmental Assessment

PREPARED BY
THE PACIFIC FISHERY MANAGEMENT COUNCIL
7700 NE AMBASSADOR PLACE, SUITE 101
PORTLAND, OR 97220
503-820-2280
WWW.PCOUNCIL.ORG

AND THE

NATIONAL MARINE FISHERIES SERVICE
7600 SAND POINT WAY NE, BIN C15700
SEATTLE, WA 98115-0070
206-526-6150

SEPTEMBER 2010

TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER 1 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

This document provides background information about, and analyses for, a groundfish harvest specification framework that incorporates new National Standard 1 (NS1) guidelines to prevent overfishing. The proposed action would require an amendment to the Pacific Coast Groundfish Fishery Management Plan (FMP), which contains the policies and framework for allocating the harvestable surplus of groundfish. The proposed action must conform to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 nautical miles from shore.

In addition to addressing MSA mandates, this document is an environmental assessment (EA), pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. This document is organized so that it contains the analyses required under NEPA.

1.2 Description of the Proposed Action

The Council/NMFS *proposed action*, evaluated in this document, is to revise relevant sections of the Groundfish FMP to ensure they are consistent with the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) and guidelines published in Federal regulations at Section 600.310. The guidelines describe fishery management approaches to meet the objectives of National Standard 1 found in the MSA, Section 301. National Standard 1) states that "conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the U.S. fishing industry." The MSRA amended the MSA to include new requirements for annual catch limits (ACLs), accountability measures (AMs), and other provisions regarding preventing and ending overfishing and rebuilding fisheries. NMFS published revised National Standard (NS1) guidelines in the Federal Register on January 16, 2009. The revisions to the

NS1 guidelines address, among other things, new requirements to have annual catch limits (ACLs) and accountability measures (AMs) for fisheries subject to overfishing by 2010, and for all fisheries by 2011. A stock or stock complex may not require an ACL and AMs if it qualifies for a statutory exception under the Magnuson-Stevens Act. The NS1 guidelines also discuss how stocks should be classified in the FMP.

The guidelines are intended to meet the objectives of NS1 by providing guidance on:

1. Specifying maximum sustainable yield (MSY) and optimum yield (OY);
2. Specifying status determination criteria (SDC) so that overfishing and overfished determinations can be made for stocks and stock complexes that are part of a fishery;
3. Preventing overfishing and achieving OY, incorporation of scientific and management uncertainty in control rules, and adaptive management using annual catch limits (ACL) and accountability measures (AMs) to ensure ACLs are not exceeded; and
4. Rebuilding stocks and stock complexes.

The Council is revising the FMP to be consistent with revised NS1 Guidelines in order to more effectively prevent overfishing and rebuild overfished stocks, or stocks that may become overfished.

1.3 Purpose and Need for the Proposed Action

The purpose and need for Amendment 23 is to amend the harvest specifications framework in the FMP to meet new requirements in the MSRA regarding annual catch limits and accountability measures, and to be consistent with the revised NS1 guidelines. The revised NS1 guidelines introduce and/or define new fishery management concepts including overfishing limits (OFLs), an acceptable biological catch (ABC) that incorporates a scientific uncertainty buffer , ACLs, annual catch targets (ACTs), and AMs that are designed to better account for scientific and management uncertainty and to prevent overfishing. Annual catch limits and accountability measures are required to be implemented by 2011 for most species and by 2010 for those species designated as being subject to overfishing. There are no groundfish species currently subject to overfishing, so 2011 is the implementation goal.

1.4 Scoping Process

1.4.1 *Council and Agency NEPA Scoping*

The Council process, which is based on stakeholder involvement and allows for public participation and public comment on fishery management proposals during Council, subcommittee, and advisory body meetings, is the principal mechanism to scope the EA. The advisory bodies involved in groundfish management include the Groundfish Management Team (GMT), with representation from state, federal, and tribal fishery scientists; and the Groundfish Advisory Subpanel (GAP), whose members are drawn from the commercial, tribal, and recreational fisheries, fish processors, and environmental advocacy organizations. Meetings of the Council and its advisory bodies constitute the Council scoping process, involving the development of alternatives and consideration of the impacts of the alternatives.

The Council first determined the need for a new harvest specification framework in April 2009 and accordingly decided to proceed with Amendment 23.

1.4.2 *Summary of Comments Received*

In April 2009, Laura Pagano representing the Natural Resources Defense Council (NRDC), Ken Stump representing the Marine Fish Conservation Network (MFCN), and Jen Kassakian representing The Ocean Conservancy recommended the Council proceed with Amendment 23. All three organizations recommended that the following elements be incorporated within the Amendment 23 harvest specification framework:

- ACLs should be specified for all stocks that are "in the fishery". They further noted that the vast majority of stocks managed under the FMP are in the fishery;
- Review current stock complex groupings to ensure that the species in each complex are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that management impacts are similar;
- The Council, in consultation with the SSC and the regional science centers, should evaluate and include in the FMP any species or stocks not currently listed in the FMP that qualify as "stocks in the fishery," based on a vulnerability analysis or other relevant information;
- The Council must establish an ABC control rule that accounts for scientific uncertainty. Further, the NRDC and MFCN recommended a significant modification of the current ABC control rule is needed to adequately account for scientific uncertainty; and
- Adequate accountability measures are needed in the FMP to ensure ACLs are not exceeded to prevent overfishing.

The NRDC and MFCN further recommended that if the ABC control rule is structured to account for different levels of information available for each stock in the FMP, then the system of uncertainty buffers for each category or "tier" should provide increasing precaution with decreasing levels of information and increasing uncertainty. They also recommended that the FMP complies fully with the new requirements of the law and the revised NS1 and NS2 guidelines.

The Ocean Conservancy further recommended that the Council consider whether additional species outside of the scope of the FMP should be considered "ecosystem components".

In June 2009, Karen Garrison representing NRDC commented that Amendment 23 needs to have meaningful control rules. She agreed with the SSC approach for developing ABC control rules and encouraged timely completion of that task so that Amendment 23 can be implemented by 2011 as mandated by the re-authorized MSA.

In June 2009, Ben Enticknap representing Oceana commented that Amendment 23 should include all species caught in west coast groundfish fisheries. He recommended developing ACLs for species such as spiny dogfish and including the grenadier and skate species that are currently not in the FMP and specifying ACLs for all these species under Amendment 23.

In November 2009, Chris Dorsett representing Oceana reiterated the need for a more comprehensive approach for defining scientific uncertainty and urged new ABC control rules for category 1, 2, and 3 species with larger scientific uncertainty buffers for stocks with greater scientific uncertainty. He recommended the use of the Productivity and Susceptibility Assessment (PSA) in developing new ABC control rules and in determining stock complexes. He further recommended a full suite of AMs in the FMP including the ACT with specific triggers for these AMs. He also recommended objective criteria be developed for determining species relationships when deciding new stock complexes.

In November 2009, Ralph Brown, a groundfish trawl fisherman from Brookings, Oregon and Brad Pettinger, executive director of the Oregon Trawl Commission, expressed concern that Amendment 23

was overly conservative in that too many precautionary buffers were being considered. They both believed there was adequate precaution built into the current harvest specification framework.

In June 2010, Butch Shear and Geoff Shester, representing Oceana, recommended consideration of ecological factors when setting ACLs.

In June 2010, Laura Pagano and Jeff Russell, representing NRDC, and Dana Wolf, representing The Ocean Conservancy, recommended including an analysis of criteria for determining P*. They also recommended the Option 2 40-10 harvest control rule. Ms. Dana Wolf also recommended the Amendment 23 analysis should be prepared as an EIS because she believed Amendment 23 imposed significant environmental effects.

CHAPTER 2 DESCRIPTION OF THE ALTERNATIVES

There are three alternatives analyzed in this EA: a no action alternative that maintains the existing harvest specification framework and two action alternatives that incorporate the new NS1 guidelines. Figure 2-1 depicts a simple comparison of the harvest specifications under these alternatives.

The action alternatives analyzed in this EA incorporate the new NS1 guidelines for a harvest specification framework that is designed to more clearly account for scientific and management uncertainty, and to prevent overfishing. The two action alternatives differ in two respects. First, they differ with regard to the ABC control rule, which is described in the revised NS1 guidelines. Second, they differ as to how the existing "40-10" harvest control rule and the new "25-5" harvest control rule for assessed flatfish species are defined in relation to new fishery management concepts described in the NS1 Guidelines. These alternative harvest control rules under the proposed Amendment 23 framework are described in sections 2.2.2 and 2.3.2.

The Council decided in June 2010 that Action Alternative 2 incorporating the new NS1 guidelines is their preferred alternative under Amendment 23.

<table>
<tr><th colspan="2">Current Harvest Specification Framework</th><th colspan="2">Am. 23 Harvest Specification Framework</th></tr>
<tr><td>ABC</td><td>Overfishing Limit</td><td>OFL</td><td>Overfishing Limit</td></tr>
<tr><td rowspan="2"></td><td rowspan="2">Buffer accommodates scientific uncertainty, management uncertainty, socioeconomic concerns, rebuilding concerns, etc.</td><td>ABC</td><td>Buffer accommodates scientific uncertainty</td></tr>
<tr><td>ACL</td><td>Buffer accommodates management uncertainty, socioeconomic concerns, rebuilding concerns, consideration of ecological factors, etc.</td></tr>
<tr><td>OY</td><td></td><td></td><td></td></tr>
<tr><td>HG</td><td>Buffer accommodates ad hoc sector allocations and other management objectives</td><td>ACT</td><td>Buffer could accommodate management uncertainty, inseason catch monitoring uncertainty, ad hoc sector allocations and other management objectives</td></tr>
</table>

Figure 2-1. A comparison of the current harvest specifications under the No Action Alternative to the contemplated harvest specifications under the Amendment 23 action alternatives.

2.1 The No Action Alternative: The Existing Harvest Specification Framework

2.1.1 *Harvest Specifications*

Harvest specifications are decided biennially under the existing framework with two one-year ABCs, OYs, and, in some cases, harvest guidelines (HGs), specified for each actively managed stock and stock complex in the FMP. Chapter 4 of the FMP details how these specifications are determined and chapter 5 details the process for deciding biennial harvest specifications.

The existing harvest specification framework mandates specification of an ABC, which is the maximum sustainable yield (MSY) harvest level associated with current stock abundance. The ABC under the existing framework is the overfishing limit. For assessed stocks, the ABC is derived by applying a deterministic or proxy harvest rate estimated to result in MSY (F_{MSY}) to the estimated exploitable biomass of the stock. Detailed biological information is not routinely available for unassessed stocks, and ABC levels are typically established on the basis of average historical landings, trends in a fishery independent survey, or some other index of current biomass.

The principle harvest specification under the existing framework used to manage fisheries and achieve MSA and FMP objectives is the OY. The MSA and FMP defines the OY as "the amount of fish which will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems; that is prescribed on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor; and, in the case of an overfished fishery, that provides for rebuilding to a level consistent with producing the MSY in such fishery. OY may be established at the stock or stock complex level, or at the fishery level. Achieving, on a continuing basis, the optimum yield from each fishery means producing, from each stock, stock complex, or fishery: a long-term series of catches such that the average catch is equal to the OY, overfishing is prevented, the long term average biomass is near or above B_{MSY}, and overfished stocks and stock complexes are rebuilt consistent with timing and other requirements of section 304(e)(4) of the Magnuson-Stevens Act." The OY specification can be set equal to the ABC for healthy stocks that have an estimated biomass at or above the B_{MSY} target for that stock. The OY can be set below the ABC as a buffer to accommodate scientific uncertainty, management uncertainty, socioeconomic concerns, rebuilding concerns, and any other considerations. Harvest control rules (described in section 2.1.2) determine the default approaches for setting OYs for stocks below the B_{MSY} target but above the minimum stock size threshold (MSST) below which a stock is considered overfished (see section 2.1.5). Adopted rebuilding plans determine the fishing mortality rate, and hence the OYs, for stocks that are overfished.

Harvest guidelines (HGs) are used to specify sector allocations (both long-term formal allocations and ad hoc two-year allocations) or to allocate a prescribed OY geographically (e.g., southern black rockfish HGs have been specified for Oregon and California fisheries in recent years). Harvest guidelines are determined in the biennial specifications process and can be exceeded inseason as determined by a Council/NMFS decision. Harvest guidelines can only be adjusted inseason if they resulted from incorrect data or from computational errors. Automatic actions are often prescribed if an HG is prematurely attained before a fishery managed with an HG is set to close.

2.1.2 *Harvest Control Rules*

The default harvest control rule in the FMP is called the "40-10" rule and is an adjustment of the OY below the ABC for a stock in the precautionary zone (i.e., estimated biomass below the B_{MSY} target but above the MSST). The OY is adjusted progressively lower as the stock's depletion (i.e., estimated

biomass relative to its estimated unfished biomass) is progressively lower than the target of 40% of unfished biomass (denoted $B_{40\%}$) until at $B_{10\%}$, the OY is set to zero (Figure 2-2). The slope of the line describing the OY adjustment relative to the ABC is defined by intersecting the ABC line at $B_{40\%}$ and the x-axis at $B_{10\%}$. In practice, the 40-10 adjustment is only applied to stocks in the precautionary zone that are managed using the proxy $B_{40\%}$ B_{MSY} target with an MSST of $B_{25\%}$. For overfished stocks with an estimated depletion below the MSST, OYs are decided using analyses and considerations for developing a rebuilding plan.

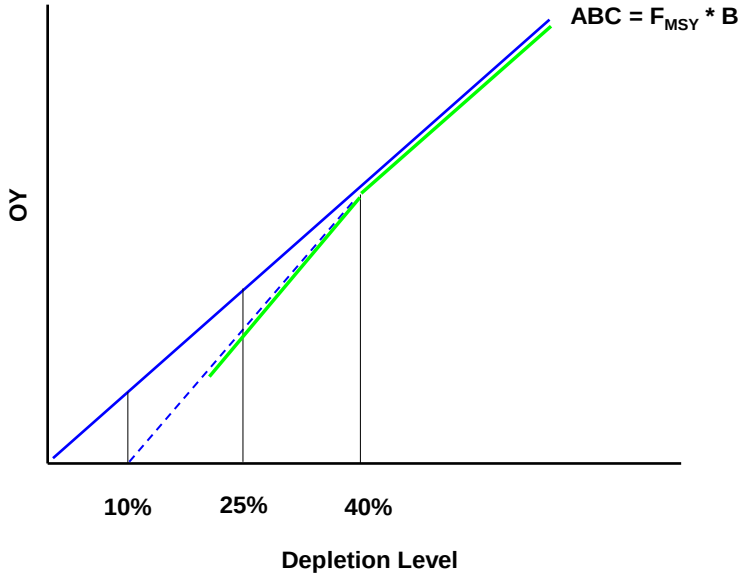

Figure 2-2. The default "40-10" harvest control rule.

2.1.3 *Species Managed in the FMP*

The stocks and stock complexes currently managed in the FMP are shown in Table 2-1. The FMP specifies that all rockfish genera and species of the family *Scorpaenidae* endemic to the west coast are included in the FMP.

The harvest specifications denoted in section 2.1.1.1 are applied at the level of aggregation shown in Table 2-1. New stock assessments and other considerations could compel a change in the level of stock aggregation that harvest specifications are applied. Such decisions are made every other year during the biennial specifications process and do not require an FMP amendment. However, adding species to or removing species from the FMP does require an FMP amendment.

Table 2-1. Stocks and stock complexes managed under the Pacific Coast Groundfish Fishery Management Plan at the level of aggregation where harvest specifications are proposed to be specified in 2011 and 2012. Component stocks of a managed complex have common names in *italics*.

Stock or Stock Complex	Harvest Specifications Used in Management	Proposed Amendment 23 Action
OVERFISHED SPECIES		
Bocaccio S. of 40^{0}10' N lat.	ABC/OFL & OY/ACL	
Canary Rockfish	ABC/OFL & OY/ACL	
Cowcod S. of 40^{0}10' N lat.	ABC/OFL & OY/ACL	
Darkblotched Rockfish	ABC/OFL & OY/ACL	
Pacific Ocean Perch	ABC/OFL & OY/ACL	
Widow Rockfish	ABC/OFL & OY/ACL	
Yelloweye Rockfish	ABC/OFL & OY/ACL	
Petrale Sole	ABC/OFL & OY/ACL	
NON-OVERFISHED SPECIES		
Lingcod N. of 42º N lat. (OR & WA)	ABC/OFL & OY/ACL	
Lingcod S. of 42º N lat. (CA)	ABC/OFL & OY/ACL	
Pacific Cod	ABC/OFL & OY/ACL	
Pacific Whiting	ABC & OY	International treaty exemption
Sablefish (coastwide)	ABC/OFL	
Sablefish N. of 36º N lat.	OY/ACL	
Sablefish S. of 36º N lat.	OY/ACL	
Shortbelly Rockfish	ABC/OFL & OY/ACL	
Chilipepper S. of 40^{0}10' N lat.	ABC/OFL & OY/ACL	
Splitnose S. of 40^{0}10' N lat.	ABC/OFL & OY/ACL	
Yellowtail N. of 40^{0}10' N lat.	ABC/OFL & OY/ACL	
Shortspine Thornyhead (coastwide)	ABC/OFL	
Shortspine Thornyhead - N. of 34º27' N lat.	OY/ACL	
Shortspine Thornyhead - S. of 34º27' N lat.	OY/ACL	
Longspine Thornyhead (coastwide)	ABC/OFL	
Longspine Thornyhead - N. of 34º27' N lat.	OY/ACL	
Longspine Thornyhead - S. of 34º27' N lat.	OY/ACL	
Black Rockfish (WA)	ABC/OFL & OY/ACL	
Black Rockfish (OR-CA)	ABC/OFL & OY/ACL	
California Scorpionfish	ABC/OFL & OY/ACL	
Cabezon (CA)	ABC/OFL & OY/ACL	
Cabezon (OR)	ABC/OFL & OY/ACL	
Dover Sole	ABC/OFL & OY/ACL	
English Sole	ABC/OFL & OY/ACL	
Arrowtooth Flounder	ABC/OFL & OY/ACL	
Starry Flounder	ABC/OFL & OY/ACL	
Longnose Skate	ABC/OFL & OY/ACL	
STOCK COMPLEXES		
Minor Rockfish North	ABC/OFL & OY/ACL	
Minor Nearshore Rockfish North	ABC/OFL & OY/ACL	
Black and yellow		
Blue		
Brown		
Calico		
China		
Copper		
Gopher		
Grass		

Stock or Stock Complex	Harvest Specifications Used in Management	Proposed Amendment 23 Action
Kelp		
Olive		
Quillback		
Treefish		
Minor Shelf Rockfish North	ABC/OFL & OY/ACL	
Bronzespotted		
Bocaccio		
Chameleon		
Chilipepper		
Cowcod		
Dusky		Remove from FMP
Dwarf-red		Remove from FMP
Flag		
Freckled		
Greenblotched		
Greenspotted		
Greenstriped		
Halfbanded		
Harlequin		
Honeycomb		
Mexican		
Pink		
Pinkrose		
Puget Sound		
Pygmy		
Redstripe		
Rosethorn		
Rosy		
Silvergray		
Speckled		
Squarespot		
Starry		
Stripetail		
Swordspine		
Tiger		
Vermilion		
Minor Slope Rockfish North	ABC/OFL & OY/ACL	
Aurora		
Bank		
Blackgill		
Redbanded		
Rougheye		
Sharpchin		
Shortraker		
Splitnose		
Yellowmouth		
Minor Rockfish South	ABC/OFL & OY/ACL	
Minor Nearshore Rockfish South	ABC/OFL & OY/ACL	
Shallow Nearshore Species		
Black and yellow		
China		

Stock or Stock Complex	Harvest Specifications Used in Management	Proposed Amendment 23 Action
Gopher		
Grass		
Kelp		
Deeper Nearshore Species		
Blue		
Brown		
Calico		
Copper		
Olive		
Quillback		
Treefish		
Minor Shelf Rockfish South	ABC/OFL & OY/ACL	
Bronzespotted		
Chameleon		
Dusky		Remove from FMP
Dwarf-red		Remove from FMP
Flag		
Freckled		
Greenblotched		
Greenspotted		
Greenstriped		
Halfbanded		
Harlequin		
Honeycomb		
Mexican		
Pink		
Pinkrose		
Pygmy		
Redstripe		
Rosethorn		
Rosy		
Silvergray		
Speckled		
Squarespot		
Starry		
Stripetail		
Swordspine		
Tiger		
Vermilion		
Yellowtail		
Minor Slope Rockfish South	ABC/OFL & OY/ACL	
Aurora		
Bank		
Blackgill		
Pacific ocean perch		
Redbanded		
Rougheye		
Sharpchin		
Shortraker		
Yellowmouth		

Stock or Stock Complex	Harvest Specifications Used in Management	Proposed Amendment 23 Action
Other Flatfish	ABC/OFL & OY/ACL	
Butter sole		
Curlfin sole		
Flathead sole		
Pacific sanddab		
Rex sole		
Rock sole		
Sand sole		
Other Fish	ABC/OFL & OY/ACL	
Big skate		
California skate		
Leopard shark		
Soupfin shark		
Spiny dogfish		
Finescale codling		
Pacific rattail		
Ratfish		
Cabezon (WA)		
Kelp greenling		

2.1.4 *Species Categories*

Species are categorized in the FMP relative to the amount of data informing a stock's harvest specifications. For the purpose of setting MSY, ABC, the maximum fishing mortality threshold (MFMT), the MSST, OY, and rebuilding standards, three categories of species are identified. The first are those species for which a relatively data-rich quantitative stock assessment can be conducted on the basis of catch-at-age, catch-at-length, 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, including a relatively data-poor quantitative assessment or a non-quantitative assessment. 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, there is limited data to quantitatively determine MSY, ABC, or an overfished threshold. Typically, average catches are used to determine the ABC for category 3 species.

Precautionary adjustments to OYs to account for scientific and management uncertainty are typically specified for category 2 and 3 species with a greater reduction of the OY from the ABC for category 3 species than for category 2 species. Typically, 25% and 50% OY reductions have been specified for category 2 and 3 species, respectively.

2.1.5 *Status Determination Criteria*

National Standard 1 guidelines recommend specification of status determination criteria (SDC), which are the quantifiable factors, MFMT, ABC, and MSST, or their proxies, that are used to determine if overfishing has occurred, or if the stock or stock complex is overfished. Magnuson-Stevens Act (section 3(34)) defines both "overfishing" and "overfished" to mean a rate or level of fishing mortality

that jeopardizes the capacity of a fishery to produce the MSY on a continuing basis. "Overfished" relates to biomass of a stock or stock complex, and "overfishing" pertains to a rate or level of removal of fish from a stock or stock complex.

These SDC are already included in the FMP and all actively managed stocks and stock complexes are required to have estimated or proxy ABCs and MFMT specified in regulations. The MSST is also required for assessed stocks (the MSST cannot be estimated for unassessed stocks since stock status or depletion is not known). The MFMT is the F_{MSY} harvest rate used to establish the ABC. The current MFMTs are proxy values, although estimated F_{MSY} can be specified as an MFMT for category 1 stocks if recommended by the SSC and adopted by the Council. The current default proxy F_{MSY}/MFMT harvest rates are $F_{30\%}$ for flatfish, $F_{40\%}$ for Pacific whiting, $F_{50\%}$ for rockfish, and $F_{45\%}$ for other species such as sablefish and lingcod.

The MSST is the estimated biomass level of the stock relative to its unfished biomass (i.e., depletion level) below which the stock is considered overfished. Development of a rebuilding plan is required once a stock's biomass declines below the MSST. The MSST can be estimated for a category 1 stock from an assessment or can be a proxy depletion level as recommended by the SSC and adopted by the Council. The NS1 guidelines recommend the MSST can be no lower than 50% of the B_{MSY} target; this limit is specified in the FMP. The current default proxy MSST for all the actively managed groundfish stocks and stock complexes, other than the assessed flatfish species, is $B_{25\%}$, which is 62.5% of the B_{MSY} target of $B_{40\%}$. The current default proxy MSST for the assessed flatfish species is $B_{12.5\%}$, which is 50% of the B_{MSY} target of $B_{25\%}$.

2.1.6 *Accountability Measures*

Inseason catch monitoring and adjustments to fisheries to stay within specified OYs are the principal AMs under the No Action Alternative. Other AMs used in the current management framework include automatic closure of sectors or other management actions (e.g., automatic depth restrictions) that are implemented in cases where there is early attainment of sector-specific total catch limits specified for some species (these AMs are currently applied to minimize bycatch of some overfished species in the whiting trawl fishery). Likewise, automatic actions, such as fishery closure or changes in season length or depth restrictions, can occur when HGs are attained early. Sector-specific total catch limits and automatic actions associated with early attainment of HGs are decided in the biennial specifications process.

2.2 Action Alternative 1: The Amendment 23 Harvest Specification Framework with the Straight Percentage Buffers ABC Control Rule and the Option 1 ACL Harvest Control Rule

2.2.1 *Harvest Specifications*

The harvest specifications depicted in the column labeled, "The Alternative Am. 23 Harvest Specification Framework" in Figure 2-1 are recommended in the new NS1 guidelines. The OFL is the recommended MSY harvest level and is defined exactly as the ABC specification in the current harvest specification framework in the FMP. Action Alternative 1 under Amendment 23 redefines the current ABC specification as the OFL. The Council adopts OFLs that are recommended by the SSC.

The ABC control rule, according to the new revised NS1 guidelines, incorporates a scientific uncertainty buffer that will in most cases result in an ABC below the OFL. This Amendment 23 alternative includes a control rule for determining ABC as outlined in the new NS1 guidelines.

The OY is maintained in the FMP as a long term average harvest level that best meets MSA objectives (see the legal definition of OY in section 2.1.1). This alternative retains the OY as recommended in the new NS1 guidelines and defined in the MSA. Under Amendment 23, the FMP language is modified slightly to incorporate the verbatim legal definition of OY from the NS1 guidelines.

The ACL is described in the revised NS1 guidelines as the harvest specification which is the effective fishing mortality limit used to annually manage fisheries and which counts all sources of fishing-related mortality, including discard mortalities, against the limit. The ACL specification can be based on a buffer below the ABC to accommodate management uncertainty, socioeconomic concerns, rebuilding considerations, consideration of ecological factors, and other considerations. The revised NS1 guidelines recommend the ACL may be set equal to the ABC if those concerns and considerations do not exist. The Council has been using the OY under the current harvest specification framework as a de facto ACL since 1999 and characterizing the OY as a total catch OY to differentiate its use from the legal definition of OY in the MSA and NS1 guidelines. This alternative incorporates the ACL specification as described in the revised NS1 guidelines. Sector-specific ACLs can be used to specify formal sector allocations, such as those decided under Amendment 21.

The ACT is a level of harvest below the ACL that can be exceeded inseason or can cause closure of a fishery upon attainment. The ACT is an accountability measure but can also be considered a harvest specification similar to the current HG. Sector-specific ACTs are contemplated in the NS1 guidelines as a substitute for the sector-specific HGs used to allocate harvest opportunities biennially (i.e., for short-term ad hoc allocations). Alternative 1 under Amendment 23 incorporates the ACT as an AM and as a harvest specification as described in the revised NS1 guidelines in the FMP. An ACT is specified, if needed, for any stock or stock complex during the biennial specifications process.

Current regulations at §600.310(e)(3)(v)(C) require that fishing mortality be counted against the OY, including mortality resulting from bycatch, scientific research, and other fishing activities. Specifically, these "off-the-top" deductions are used to account for groundfish mortality in tribal fisheries, incidental open access fisheries (e.g., non-groundfish fisheries that impact groundfish stocks), scientific research, and removals under exempted fishing permits (EFPs). Under the proposed FMP Amendment 23 these sources of fishing-related mortality are deducted from either the ACL or ACT; this decision and the corresponding impacts are analyzed during the biennial specifications process. In some instances, the Council may wish to treat the ACT like the ACL and subtract the off-the-top deductions from the ACT prior to determining sector allocations. In other cases, for example, if sector-specific ACTs are used, then the off-the-top deductions may be taken from the ACL prior to calculating the ACT.

2.2.2 *Harvest Control Rules*

Under Alternative 1 for Amendment 23, there are harvest control rules for deciding the ABC specification and a translation of the existing 40-10 default rule and new 25-5 flatfish rule for deciding the ACL for stocks in the precautionary zone.

2.2.2.1 ABC Control Rule

The ABC control rules contemplated under Amendment 23 involve deciding the size of scientific uncertainty buffers that define the ABC for all actively managed stocks and stock complexes. The Alternative 1 ABC control rule for all stocks would involve straight percentage reductions from the OFL. For category 1 stocks, the ABC control rule would require a reduction based on the SSC's

recommendations. This recommendation would be described in the FMP. For category 2 stocks, a reduction of 25% would be required. For category 3 stocks, a reduction of 50% would be required.

This approach recognizes that scientific uncertainty is generally greater for category 2 stocks than category 1 stocks, and for category 3 stocks than category 2 stocks. On this basis, the percentage reductions are greatest for category 3 and least for category 1. The reductions for category 2 and 3 stocks are based on past practice. Reductions for category 1 stocks might be described as a range and would therefore allow some flexibility based on stock-specific information. However, the Alternative 1 ABC control rule allows for only very limited consideration of new scientific information, and does not allow for consideration of the Council's preferred risk aversion policy. Further, it does not allow for consideration of stock-specific factors for category 2 and 3 species. Under Alternative 1, FMP amendments would likely be needed on a relatively frequent basis, perhaps biennially, to account for changes in scientific uncertainty based on new information.

2.2.2.2 40-10 Harvest Control Rule

There are two alternatives for translating the existing 40-10 harvest control rule under Amendment 23. Alternative 1 incorporates the option 1 40-10 harvest control rule, which adjusts the ACL relative to the OFL by progressively reducing the ACL from the OFL as depletion decreases below the $B_{40\%}$ target (Figure 2-3). ACL adjustments under the Alternative 1 40-10 rule are nullified if the ABC is lower than the 40-10 adjusted ACL, since an ACL cannot exceed an ABC.

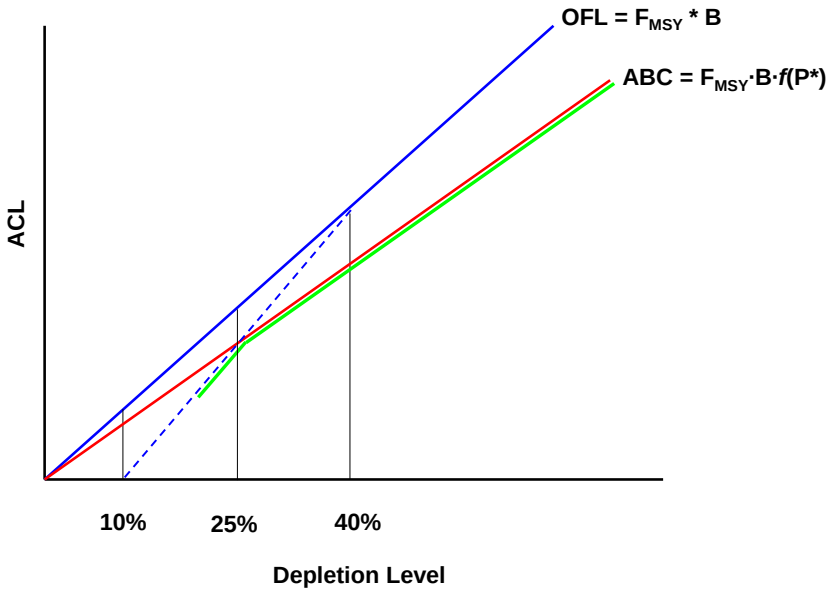

Figure 2-3. Option 1 for translating the "40-10" harvest control under Amendment 23 by adjusting the ACL from the OFL.

The SSC recommended and the Council decided to specify an analogous "25-5" harvest control rule for assessed flatfish species (this rule is described further in the DEIS for the 2011-2012 biennial specifications and management measures (PFMC (Pacific Fishery Management Council) and NMFS (National Marine Fisheries Service) 2010)). The 25-5 rule works exactly like 40-10 rule except the ACL adjustment begins when the stock's depletion drops below $B_{25\%}$ and at $B_{5\%}$, the ACL is set to zero.

The Alternative 1 25-5 control rule would apply to the OFL, as would the Alternative 1 40-10 control rule.

2.2.3 *Species Managed in the FMP*

The species complexes noted in Table 2-1 are recommended to remain under the Amendment 23 action alternatives with the exception that dusky and dwarf-red rockfish are recommended by the Council and its advisors to be removed from the FMP. These species, which are currently included in the northern and southern minor shelf rockfish complexes, are not in the fishery since they are not endemic to the U.S. west coast.

The concept of indicator stocks for managing complexes is included in the Amendment 23 alternatives. An indicator stock is a stock with measurable SDC that can be used to help manage and evaluate more poorly known stocks that are in a stock complex. If an indicator stock is used to evaluate the status of a complex, it should be representative of the typical status of each stock within the complex, due to similarity in vulnerability. If the stocks within a stock complex have a wide range of vulnerability, they should be reorganized into different stock complexes that have similar vulnerabilities; otherwise the indicator stock should be chosen to represent the more vulnerable stocks within the complex. In instances where an indicator stock is less vulnerable than other members of the complex, management measures need to be more conservative so that the more vulnerable members of the complex are not at risk from the fishery. More than one indicator stock can be selected to provide more information about the status of the complex. When indicator stock(s) are used, periodic re-evaluation of available quantitative or qualitative information (e.g., catch trends, changes in vulnerability, fish health indices, etc.) is needed to determine whether a stock is subject to overfishing, or is approaching (or in) an overfished condition.

Pacific whiting is recommended to be exempted from the Amendment 23 action under the action alternatives since this stock is managed under an international treaty between the U.S. and Canada. An international Pacific Whiting Commission will likely develop a harvest specification framework for Pacific whiting once the Commission process is fully implemented. Until that time, the existing harvest specification framework described under the No Action Alternative is recommended to be used to manage Pacific whiting.

No new species are recommended to be included in the FMP under the Amendment 23 action alternatives.

No species currently managed under the FMP are recommended to be categorized as Ecosystem Component species under the Amendment 23 action alternatives. However, the proposed Amendment 23 action does include frameworking the category of Ecosystem Component species in the FMP as recommended in the new NS1 guidelines for future consideration of such a categorization for any FMP species.

2.2.4 *Species Categories*

The species categories described in section 2.1.3 are maintained under the Amendment 23 alternatives, although the description of each category is refined under the proposed action. Scientific uncertainty informing stock harvest specifications is progressively greater for category 1, 2, and 3 stocks and, under the preferred alternative, scientific uncertainty buffers defining the ABC are generally greater for stocks categorized under the progressively more uncertain categories 2 and 3.

A new category of Ecosystem Component (EC) species is proposed under the Amendment 23 alternatives. These species are not "in the fishery" and therefore not actively managed. EC species are not targeted in any fishery and are not generally retained for sale or personal use. EC species are not determined to be subject to overfishing, approaching an overfished condition, or overfished, nor are they likely to become subject to overfishing or overfished in the absence of conservation and management measures. While EC species are not considered to be "in the fishery," the Council should consider measures for the fishery to minimize bycatch and bycatch mortality of EC species consistent with National Standard 9, and to protect their associated role in the ecosystem. EC species do not require specification of reference points but should be monitored to the extent that any new pertinent scientific information becomes available (e.g., catch trends, vulnerability, etc.) to determine changes in their status or their vulnerability to the fishery. If necessary, they should be reclassified as "in the fishery." Any future categorization of existing species as EC species or reclassification of EC species as stocks that are "in the fishery" will require an FMP amendment.

2.2.5 *Status Determination Criteria*

The SDC currently in the FMP (described in section 2.1.5) comply with the new NS1 guidelines and are maintained in the Amendment 23 alternatives. The only recommended change for SDC is the redefinition of the ABC to the OFL as recommended in the revised NS1 guidelines.

2.2.6 *Accountability Measures*

The AMs described in section 2.1.6 are maintained under the Amendment 23 alternatives. The action alternatives also incorporate the ACT as an AM in the FMP. The ACT is a harvest level set below the ACL and provides a means to better stay within specific ACLs in cases where there is greater management and catch monitoring uncertainty. The revised NS1 guidelines recommend specifying an ACT if an ACL is exceeded more often than once every four years, which is the performance standard incorporated in the FMP under the Amendment 23 alternatives. Other possible uses of the ACT are discussed in section 0.

2.3 The Preferred Action Alternative 2: Include The P* ABC Control Rule Alternative with the Alternative 2 ACL Harvest Control Rule

The action alternatives analyzed in this EA incorporate the new NS1 guidelines for a harvest specification framework that is designed to better account for uncertainty in estimating the MSY harvest level and to prevent overfishing in the FMP. The two action alternatives adopt the same Amendment 23 harvest specification framework and are identical except for how the "40-10" harvest control rule is defined under the new framework. Both action alternatives contemplate a new "25-5" harvest control rule for assessed flatfish species.

2.3.1 *Harvest Specifications*

The Amendment 23 harvest specifications described in section 2.2.1 are incorporated in the FMP under the Council's preferred Amendment 23 Alternative 2.

2.3.2 *Harvest Control Rules*

2.3.2.1 ABC Control Rule

Under Alternative 2, the ABC for Category 1 stocks is decided by the Council based on its preferred level of overfishing risk aversion and the recommendations of the SSC regarding the quantification of scientific uncertainty. Under this approach (referred to as the P* approach), scientific uncertainty associated with estimating an OFL (σ) is quantified by the SSC and the percentage reduction that defines the scientific uncertainty buffer and the ABC can be determined by translating the estimated σ to a range of P* values. Each P* value is then mapped to its corresponding buffer fraction[1]. The Council then determines the preferred level of risk aversion by selecting an appropriate P* value, accordingly. In cases where the P* approach is used, the upper limit of P* values considered will be 0.45.

For Category 2 and 3 stocks, the ABC control rules under Alternative 2 include either a straight percentage reduction of the OFL (25% for category 2 and 50% for category 3) that is recommended by the SSC and adopted by the Council or one that incorporates an estimated probability of overfishing (P*) based on the uncertainty in the estimation of the OFL. Because there is more scientific uncertainty regarding category 2 and 3 stocks, the buffer between OFL and ABC for these stocks will generally be greater than that for category 1 stocks. In general, the buffer for category 3 stocks will be the greatest.

The Alternative 2 ABC control rule allows for the Council's preferred level of overfishing risk aversion to be a factor in the determination of the ABC. In addition, it provides flexibility for the SSC to modify their recommendations for quantifying scientific uncertainty (sigma) as they develop new methodologies and new information becomes available. The ABC control rule for category 2 and 3 stocks reflects the fact that there is more scientific uncertainty regarding these stocks than for category 1 stocks, and therefore likely more variability in the SSC's recommendations for quantifying scientific uncertainty.

2.3.2.2 40-10 Harvest Control Rule

Under Alternative 2, the translation of the 40-10 harvest control rule is depicted on page 23 (Figure 2-4). This approach is also proposed for the new 25-5 harvest control rule for assessed flatfish species.

Alternative 2 adjusts the ACL relative to the ABC by progressively reducing the ACL from the ABC as depletion decreases below the $B_{40\%}$ target (Figure 2-4). Alternative 2 for translating the existing 40-10 rule under the new Amendment 23 alternative is more precautionary than the Alternative 1 harvest control rule since the ABC is applied before the 40-10 ACL adjustment is made.

[1] Since estimated OFLs are median estimates, there is a 50% probability that the OFL is overestimated. Therefore, a P* of 0.5 equates to no scientific uncertainty or, in other words, the ABC is set equal to the OFL.

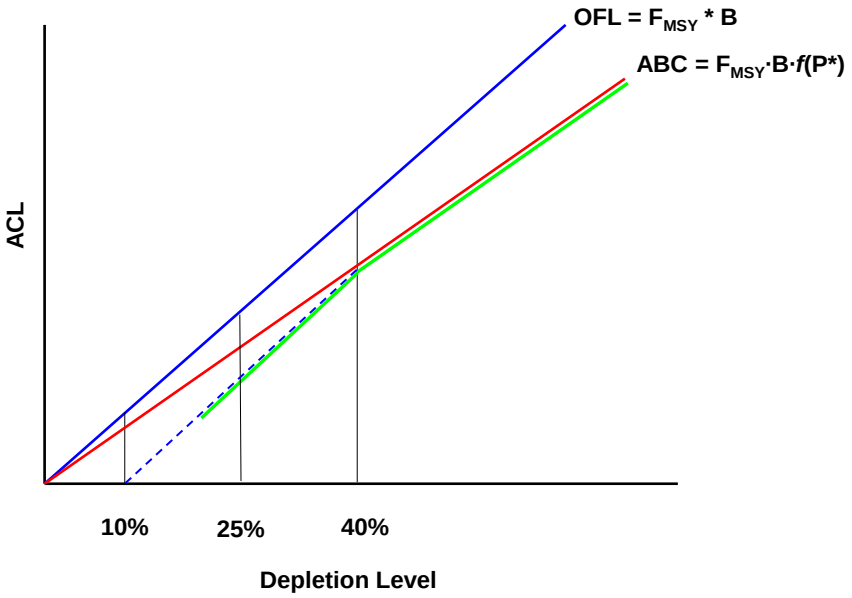

Figure 2-4. Alternative 2 for translating the "40-10" harvest control rule under Amendment 23 by adjusting the ACL from the ABC. Alternative 2 is the Council's preferred alternative under Amendment 23.

2.3.3 *Species Managed in the FMP*

The species managed in the FMP under the Council's preferred Amendment 23 alternative are the same as those described in section 2.2.3. Preferred Alternative 2 also incorporates the stock complexes under Alternative 1, including the removal of dusky and dwarf-red rockfish from the minor shelf rockfish complexes and the FMP. The concept of managing stock complexes using indicator species is also incorporated in the FMP under the preferred Alternative 2 for Amendment 23.

2.3.4 *Species Categories*

The species categories described in section 2.2.4 are proposed under the preferred Amendment 23 alternative. Incorporating the new EC species category recommended in the new NS1 guidelines is also preferred, although no FMP species are proposed for an EC species categorization under the proposed Amendment 23 action.

2.3.5 *Status Determination Criteria*

The SDC currently in the FMP (described in section 2.1.5) comply with the new NS1 guidelines and are maintained in the Council's preferred alternative for Amendment 23. The only recommended change for SDC is the redefinition of the ABC to the OFL as recommended in the revised NS1 guidelines.

2.3.6 *Accountability Measures*

The AMs described in section 2.1.6 are maintained under the Council's preferred Amendment 23 alternative. Additionally, the Council recommends the incorporation of the ACT as an AM in the FMP. The ACT is a harvest level set below the ACL and provides a means to better stay within specific ACLs in cases where there is greater management and catch monitoring uncertainty. The revised NS1 guidelines recommend specifying an ACT if an ACL is exceeded more often than once every four years, which is the performance standard incorporated in the FMP under the Council's preferred Amendment 23 alternative. Other possible uses of the ACT are discussed in section 0.

CHAPTER 3 AFFECTED ENVIRONMENT

The biological and socioeconomic resources that may be affected by the proposed action are described in other Council/NMFS documents. Historical catch and management information for each groundfish stock can be found in Volume 1 of the 2008 Status of the Pacific Coast Groundfish Fishery stock assessment and fishery evaluation (SAFE document) (PFMC 2008). This information is updated in the 2011 and 2012 biennial specifications DEIS (PFMC (Pacific Fishery Management Council) and NMFS (National Marine Fisheries Service) (2010) which provides a summary of new stock status information from assessments conducted in 2009 and 2010, as well as new management information. This information is hereby incorporated by reference to this EA and is summarized below.

More than 90 fish species are managed under the Pacific Coast groundfish FMP. These groundfish include: 60-plus rockfish, including all genera and species from the family *Scorpaenidae* (*Sebastes, Scorpaena, Sebastolobus, and Scorpaenodes*) occurring in waters off Washington, Oregon, and California; 12 flatfish species, 6 roundfish species; and 6 miscellaneous fish species that include sharks, skates, grenadiers, rattails, and morids. Rockfishes make up the majority of species managed under the Pacific Coast Groundfish FMP. Rockfishes vary greatly in their morphological and behavioral traits, with some species being semi-pelagic and found in mid-water schools, and others leading solitary, sedentary, bottom-dwelling lives (Love et al., 2002). Rockfishes inhabit a wide range of depths, from nearshore kelp forests and rock outcrops to varied deepwater (greater than 150 fm) habitats on the Continental Slope. Despite the range of behaviors and habitats, most rockfishes share general life history characteristics, which include slow growth rates, bearing live young, and large but infrequent recruitment events. These life history characteristics contribute to relatively low average productivity that may reduce their ability to withstand heavy exploitation (Parker et al., 2000), especially during periods of unfavorable environmental conditions.

Roundfish managed under the Pacific Coast Groundfish FMP include lingcod, cabezon, kelp greenling Pacific cod, sablefish and Pacific hake (whiting). Adult lingcod are a relatively sedentary species found coastwide along the rocky shelf and in nearshore habitats. Lingcod grow rapidly; reaching 12 inches in the first year and having a maximum life span of 20 years. Lingcod also make seasonal onshore/offshore migrations. Cabezon is a coastwide species that is primarily found nearshore, in intertidal areas and among jetty rocks, out to 100 m (Love 1996; Miller and Lea 1972). Cabezon may reach an age of more than 20 years (Wilson-Vanderberg 1992). Kelp greenling are relatively common along the West Coast, with the adults found in rocky reefs of shallow nearshore areas. Kelp greenling's estimated maximum age is 16 years (Howard 1992). Pacific cod are widely distributed along the Pacific

Coast from Alaska to Santa Monica, California (Hart 1973, Love 1996). Although Pacific cod prefer shallow, soft bottom habitats in marine and estuarine environments (Garrison and Miller 1982), adults have been found associated with coarse sand and gravel substrates (Garrison and Miller 1982, Palsson 1990). Compared to the other roundfish species, adult sablefish are a longer living species that is found in deeper waters, being most abundant between 200 and 1,000 m, and found as deep as 3,000 m (Beamish and McFarlane 1988, Kendall and Matarese 1987, Mason et al. 1983, Love 1996). Adult sablefish commonly occur over sand and mud (McFarlane and Beamish 1983b; NOAA 1990) in deep marine waters, but have also been found over hard-packed mud and clay bottoms in the vicinity of submarine canyons (MBC 1987). The coastal stock of Pacific hake (whiting) is a semi-pelagic merlucciid and the most abundant single-species groundfish population in the California Current system (Helser and Martell, 2008). The stock is characterized by highly variable recruitment patterns and a relatively short lifespan. In general, the species referred to as roundfish share similar morphology, are faster growing with shorter life spans then many of the rockfishes, and have external fertilization with some species having large and highly variable recruitment events.

Flatfish species from the order Pleuronectiformes have asymmetrical skulls with both eyes on the same side of the head. The 12 flatfish species in the FMP include species that have been assessed, such as arrrowtooth flounder, Dover sole, English sole, petrale sole, and starry flounder, as well as those that have not been assessed and that are managed in the "other flatfish' complex (butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole). Most of the flatfish species are distributed coastwide in waters of the continental shelf with the exception of arrowtooth flounder, butter sole, and flathead sole which are found on the shelf in waters north of central California. Flatfish species vary in deep distribution. The flatfish species primarily found in more nearshore areas include starry flounder, Pacific sanddab, butter sole, curlfin sole, sand sole and rock sole. Flatfish species found in deeper waters include Dover sole, flathead sole, and petrale sole. The remaining species show more variation in depth distribution. Many of the flatfish species migrate seasonally from shallow water summer feeding grounds on the continental shelf to deep water spawning grounds over the continental slope (NOAA 1990). Though there are variations between species, most of the flatfishes are found on soft bottom such as sand or sandy gravel substrates and mud; however, some are found in eelgrass habitats (Pearson and Owen 1992) and in the case of Arrowtooth flounder occasionally over low-relief rock-sponge bottoms (NOAA 1990).

The species managed under the Pacific Coast groundfish FMP are distributed throughout the EEZ and occupy diverse habitats at all stages in their life history. In addition, many of the stocks have geographic ranges that extend beyond the U.S. EEZ into Canadian or Mexican waters. The life history traits of the groundfish species have important implications on stock assessment and how the stocks are managed. This is because fishing alters population abundance of the target species, and can have affects on life-history traits and population dynamics that may also affect the yield. For each groundfish species, detailed information on habitat utilization patterns, fisheries that harvest the species, geographic range, migrations and movements, reproduction, growth and development, and trophic interactions are fully described in Appendix B2 to the final EIS titled "The Pacific Coast Groundfish Fishery Management Plan, EFH Designation and Minimization of Adverse Impacts (NMFS 2005). In addition to life history, historical catch, and management information for each groundfish stock can be found in the Status of the Pacific Coast Groundfish Fishery (SAFE document) Volume, Description of the Fishery (PFMC 2008).

From a socioeconomic perspective, commercial fisheries are important to coastal communities along the west coast. Recreational groundfish fisheries are also important to coastal communities (PFMC, NMFS 2010). Revenues correlate with harvest levels, and reduced harvest levels typically mean lower revenues for fishermen.

For protected species, NMFS has issued a number of biological opinions under the ESA associated with the groundfish FMP, concluding that implementation of the FMP for the Pacific Coast groundfish fishery was not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. Similarly, fishing activities currently conducted under the groundfish FMP are unlikely to have adverse impacts on marine mammals. West coast groundfish fisheries are considered Category III fisheries under the MMPA, indicating a remote likelihood of or no known serious injuries or mortalities to marine mammals.

The Council's preferred Amendment 23 alternative essentially incorporates all the relevant elements of the revised NS1 guidelines into the FMP. The relatively modest impacts associated with the proposed Amendment 23 action relative to the No Action alternative are detailed below with further elaboration of the analyses done to inform Amendment 23 considerations starting in Section 3.

3.1 Direct and Indirect Impacts of the Alternatives

3.1.1 Impacts to the Physical Environment

There are no direct or indirect impacts to groundfish essential fish habitat (EFH) or the California current ecosystem since there are no management measures associated with the proposed action. The proposed action to implement a new harvest specification framework, as well as the No Action alternative to maintain the existing framework, does not concern how allowable harvests are allocated to different gear groups or how harvest opportunities are prosecuted. Such direct and indirect impacts are the concern of the biennial specification process and analyzed in separate environmental analyses that are part of that process.

3.1.2 Impacts to the Biological Environment

There are no direct and indirect impacts associated with the Amendment 23 action to non-groundfish biological resources since the existing and proposed harvest specification framework only concerns how to set annual harvest limits for groundfish species. The only effect of the action alternatives is to formalize the procedures for accounting for uncertainty in managing the harvest of the groundfish resource with the intent of reducing the risk of overfishing. If the new procedures work as intended and absent negative outside environmental influences, they could result in somewhat more stable stock levels in the long term.

The difference in direct and indirect impacts to groundfish resources between the No Action and the two action alternatives analyzed in this EA are relatively minor given that the existing harvest specification framework is only slightly modified under the proposed action. For instance, the annual MSY harvest level (i.e., the ABC under the existing framework and described under the No Action alternative and the OFL under the proposed framework and described under both action alternatives) is determined in exactly the same way. Likewise, the effective annual harvest limit (i.e., the total catch OY under the No Action alternative and the ACL under the action alternatives) is defined and managed in the same way with all sources of fishing-related mortality, including research and EFP catches, counting against the specified limit. However, there are differences between the existing and proposed frameworks for incorporating scientific uncertainty in the consideration of annual harvest specifications, the definition and use of the "40-10" harvest control rule, and the explicit specification of precautionary buffers when accountability measures are not deemed sufficient to manage a species when there is high management or catch accounting uncertainty (i.e., consideration of the ACT). These differences could have direct and indirect impacts on groundfish resources.

The proposed ABC control rule under both action alternatives analyzed in this EA explicitly considers the scientific uncertainty in estimating the MSY harvest level and adds a precautionary buffer below the OFL to manage for this uncertainty. Scientific uncertainty, as well as rebuilding requirements for overfished stocks, harvest control rules to prevent stocks from becoming overfished, socioeconomic considerations, bycatch concerns for depleted species, ecological considerations, and other factors, are considerations for determining the OY under the No Action alternative. Both action alternatives contemplate a scientific uncertainty buffer first in considering the ABC harvest level below the OFL and then considering all the other factors that were used in deciding OYs when considering the ACL. This proposed change to the framework is recommended in the new NS1 guidelines. This presents a fundamental difference in the harvest specification framework between the No Action alternative and both action alternatives. Under No Action, the OY was often set equal to the MSY harvest level or ABC for healthy stocks when there was no compelling reason, such as rebuilding considerations or significant scientific uncertainty, to set an OY lower than the ABC. Since the proposed framework and new NS1 guidelines do not allow an ACL to be set higher than a specified ABC, both action alternatives are more conservative than No Action since there will always be some magnitude of a buffer below the OFL that mitigates the uncertainty in estimating the MSY harvest level (the magnitude of scientific uncertainty buffers to set ABCs are decided in the biennial specifications process). This new ABC harvest control rule should provide a long term benefit to groundfish stocks, especially in cases where there is significant scientific uncertainty in estimating the OFL and reduce the risk of overfishing with respect to this uncertainty. Both action alternatives also propose the SSC as the body that quantifies scientific uncertainty, recommends the approach for determining the ABC, and categorizing the stocks with respect to the quantity and quality of data used to estimate the OFL. Three stock categories are maintained with the proposed action with progressively larger scientific uncertainty buffers for category 1, 2, and 3 stocks, respectively.

A new category of Ecosystem Component (EC) species is considered in the new NS1 guidelines and contemplated under both action alternatives. No harvest specifications are required for EC species; however, there is a monitoring requirement to ensure these species are not targeted and that incidental bycatch does not increase to a point where there are potential stock concerns. While the No Action alternative does not contemplate an EC species categorization, there is no significant difference in the management of groundfish species due to incorporation of an EC species designation. This is because some sort of average harvest basis is used to determine the annual harvest levels of unassessed species. An EC species by definition does not have a significant historical harvest and therefore does not contribute significantly to an average harvest based specification. None of the current groundfish species are proposed to be categorized as an EC species under the action alternatives; however, both action alternatives incorporate the EC species category for future consideration in the FMP.

Differences in the definition and implementation of the 40-10 and 25-5 ACL harvest control rules for groundfish stocks in the precautionary zone distinguish the two action alternatives analyzed in this EA. Action Alternative 1 progressively lowers the ACL below the OFL as a stock's depletion decreases below the target B_{MSY} level (i.e., $B_{25\%}$ for flatfish stocks and $B_{40\%}$ for non-flatfish stocks). In this regard, this is analogous to the 40-10 OY control rule under the No Action alternative since the OY is likewise reduced below the ABC as stock depletion decreases and since the OFL under the action alternatives and the ABC under the No Action alternative are the estimated MSY harvest levels. The preferred Action Alternative 2 is inherently different from the No Action alternative and Action Alternative 1 since the ACL control rule reduces the ACL below the ABC, not the MSY harvest level as stock depletion decreases below the B_{MSY} target. The preferred Action Alternative 2 is therefore more precautionary than the other alternatives analyzed since it results in lower ACL/OY harvest levels for stocks in the precautionary zone, which will rebuild these stocks faster.

The ACT is an additional accountability measure contemplated under both action alternatives. The Council has functionally built in buffers below the total catch OY in the past by adopting management measures that cumulatively do not fully utilize the total catch OY. The proposed incorporation of the ACT as an AM directly specifies a precautionary buffer in cases where there is management/catch monitoring uncertainty and is a more transparent way to manage with such uncertainty than the indirect method under the No Action alternative of specifying management measures that do not fully utilize the OY. There is no difference in the action alternatives with respect to the use of an ACT as an AM.

3.1.3 Impacts to the Socioeconomic Environment

There are minor potential impacts to west coast fishing communities and groundfish fishery participants associated with the proposed Amendment 23 action. As explained above, the impact of the proposed ABC control rule under both action alternatives is that annual harvest levels for healthy stocks will no longer be set at the MSY harvest level. The No Action alternative allows the OY to be set equal to the MSY harvest level or ABC, while both action alternatives contemplate a scientific uncertainty buffer below the MSY harvest level or OFL in specifying an ABC. The action alternatives do allow the ACL to be set equal to the ABC. The consequence of this proposed change to fishing communities is that short term harvest levels can be relatively lower than under the No Action harvest specification framework. While this may result in slightly lower revenues to fishermen with the consequent economic effects to fishing communities, the change to the harvest specification framework should provide some longer term socioeconomic benefits associated with a reduced risk of overfishing due to uncertain estimation of appropriate MSY harvest levels. This should theoretically provide a relatively more stable framework for managing fisheries with less abrupt changes in future estimates of sustainable fishing levels.

The proposed ACL harvest control rule (i.e., the 40-10 and 25-5 precautionary adjustments) is more precautionary than the precautionary rule under the No Action alternative and Action Alternative 1. This results in lower ACLs for stocks in the precautionary zone under the preferred Action Alternative 2 with consequent short term negative socioeconomic impacts. However, this proposed modification of the precautionary adjustment will rebuild depressed stocks faster resulting in a longer term positive socioeconomic impact.

The effect of specifying an ACT, in cases where this is recommended by the Council and NMFS, has similar short and long term socioeconomic impacts as the proposed ABC and ACL control rules. The additional precautionary buffer will result in reducing the risk of overfishing due to uncertain catch monitoring.

3.2 Cumulative Effects of the Proposed Action

3.2.1 *External Actions and Ongoing Trends*

Actions are defined as regulatory and programmatic activities affecting the operational environment for FMP managed fisheries and the status of related resources. Trends are ongoing changes in baseline conditions that have occurred and may be reasonably expected to continue; these trends can be shaped by either environmental forces (e.g., climate affecting animal populations) or human behavior in the aggregate (e.g., consumption patterns). In identifying external actions that may combine with the effects of the proposed action it is important to consider their temporal aspect. An action may have occurred at some discrete time in the past but resulted in a permanent change in baseline conditions. Alternatively, an action that was initiated in the past may be continuing; this is common for the types of programmatic actions that have the greatest effect on the management system and managed resources.

So, although CEQ regulations reference "past, present, and reasonably foreseeable future actions," from an analytical standpoint what is of interest is the net effect on baseline conditions prior to implementation of this action (FMP Amendment 23 and any pursuant regulations) and any ongoing effects of these actions because they continue to exist programmatically. While the direct and indirect impacts of the proposed action may be confined to changes to the management framework with respect to which species are actively managed and the framework for establishing management controls, cumulative effects result from the application of this framework and its interaction with other activities.

External Actions:

- Stock assessments: Stock assessments are prepared under the auspices of the Council according to a published terms of reference. NMFS and other agency scientists may prepare some stock assessments and assist with some Council stock assessments. Stock assessments provide information on stock status and are the basis for developing conservation measures.
- Conservation measures established by the Council.
- Harvest specifications and management measures established through the biennial specifications process: The biennial process has been discussed above in relation to direct and indirect effects but may be considered external to the proposed action. This process may be used to set catch limits relative to conservation objectives (e.g., OY) and related management measures.
- Protected species measures: Other applicable law (ESA, MMPA, and others) addresses incidental take of protected species in groundfish FMP fisheries. These measures also indirectly affect fishing opportunity and thus target species harvests.

Ongoing Trends:

- Change in the use of ocean areas: habitat protection measures (e.g., MPAs) and offshore projects (e.g., wind and wave power, offshore aquaculture) limiting the area open to fisheries.
- Changes to coastal economies and land use: population increase in coastal areas and related growth in non-fishery-related economic activities and land use.
- Increased demand for protein affecting real prices: Population growth and rising living standards globally is likely to increase demand for fishery products. This could lead to price increases unless aquaculture increases supply at lower cost than wild-caught fish (and consumers consider the two products substitutable).
- Increased consumer awareness affecting purchasing decisions: Certification and consumer awareness programs may affect buying decisions. Consumers may become more aware of or form opinions about how effectively a fishery is managed both in terms of the status of target stocks and the effect of a particular fishery on other resources (e.g., protected species). Consumer awareness may have a marginal effect on demand for specific products (based on source) over the long term.
- Changes in stock status of exploited species: Stock status is a function of fishing mortality and other, non-anthropogenic ("natural") sources of mortality such as climate forcing effects on stock recruitment and stock productivity, and trophic effects on growth and mortality.
- Changes in stock status of protected species: Additional species may be listed under the ESA or changed from threatened to endangered status, which could result in additional mitigation measures for groundfish fisheries pursuant to section 7 consultations. Under the MMPA, revised estimates of a stock's potential biological removal (PBR) could prompt mitigation measures for groundfish fisheries. Conversely, if a population recovers it may be de-listed, allowing changes to mitigation measures.
- Cyclical and ongoing climate change will affect stock productivity in the northeast Pacific: Cyclical events (ENSO, PDO) and long-term climate change affects the relative productivity of different marine organisms with attendant ecosystem effects.

3.2.2 *Managed Species*

The purpose of the proposed action, in addressing revised NS1 guidelines, is to prevent overfishing and manage stocks to optimum yield. Stock assessments provide information on the status of the stock. The level of domestic fishing is partly a function of changes in global demand for fishery products. Conservation measures adopted by the Council are intended to manage fisheries against explicit or implicit targets or limits, e.g., F_{MSY}, but are not always effective. The proposed action would be primarily implemented through the existing biennial process during which current reference points, including OY, would be evaluated and adjusted if needed. Harvest limits and related management measures could be implemented to address the relative impact of west coast fisheries.

3.2.3 *Fishery Ecosystem*

Protected species impacts are primarily addressed through the ESA, MMPA, and other applicable law. Management measures implemented through the biennial process, intended to achieve optimum yield (consistent with the harvest specifications framework of the proposed action), could indirectly affect the spatio-temporal distribution of fishing effort. This in turn affects the likelihood of protected species interactions. During the fishing season, these affects could increase or decrease, depending on the distribution of fishing effort, which is difficult to predict. These potential changes are monitored and evaluated by state and federal fishery managers to identify any significant change in affect, and to consider whether management actions are needed to decrease the likelihood of these interactions. However, for the Amendment 23 action as anticipated, the action alternatives are unlikely to differ from No Action in terms of these effects.

3.2.4 *Socioeconomic Environment*

Coastal communities are affected by ex-vessel revenue due to commercial fishery landings. Recreational fisheries provide both market and non-market benefits. Catches and landings may be affected by changes in the status of the resource and management measures that may constrain commercial and recreational fishing opportunity. In addition, commercial and recreational fisheries are often an important part of a community's social and touristic identity. Coastal development can compete with existing fisheries infrastructure for waterfront access and real estate.

The action alternatives are unlikely to differ substantially from No Action in terms of cumulative socioeconomic impacts. Under all the alternatives achieving optimum yield could require constraining fishing opportunity through the implementation of management measures.

3.3 Operational Differences of the Alternatives

This section is meant to provide a discussion of the operational differences among the alternatives for this proposed action.

The harvest specifications recommended in the revised NS1 guidelines and under the Council's preferred Amendment 23 alternative are not significantly different than those in the existing harvest specification framework and described under the No Action alternative.

As described in section 2.2.1, the OFL is defined and determined exactly as the ABC specification in the current framework. The preferred alternative is to simply redefine the ABC in the current FMP as the OFL.

The new ABC specification recommended in the NS1 guidelines and in the preferred alternative is the specification that is arguably the most divergent in the proposed Amendment 23 alternative relative to the No Action alternative. Explicitly considering the scientific uncertainty in estimating the MSY harvest level (i.e., the OFL under the proposed Amendment 23 alternative and the ABC under the existing No Action alternative) will require new considerations and new harvest control rules (see sections 2.2.2, 2.3.2, and 3.4). Under the No Action alternative, scientific uncertainty in estimating MSY was one of many considerations in deciding the total catch OY. Under Amendment 23, scientific uncertainty is considered independently of management uncertainty, socioeconomic considerations, rebuilding considerations, and all other considerations that entered into an OY decision under the old framework. Also, under the No Action alternative, OYs were often set equal to ABCs for healthy stocks with biomass estimated at or above the target B_{MSY} levels. This will not occur under the preferred alternative for Amendment 23 given that a scientific uncertainty buffer below the OFL will be decided in setting future ABCs. In cases where a P* approach is used, the upper limit of P* is 0.45 (a P* of 0.5 equates to no scientific uncertainty buffer (i.e., ABC=OFL)). Alternatively, the proposed Amendment 23 alternative would establish a straight percentage reduction from the OFL for deciding the ABC if a P* approach is not used.

The ACL specification is not a significantly new harvest threshold in the proposed Amendment 23 alternative relative to the existing No Action alternative. While the OY, as described in the existing FMP and maintained in the Amendment 23 preferred alternative, is inherently different from the ACL recommended in the NS1 guidelines and the preferred Amendment 23 alternative, the use of total catch OYs in Council decision making since 1999 complies with the new ACL definition.

The ACT and its use as a sector HG under the preferred Amendment 23 alternative are not different from the use of the HG under the No Action alternative. Further discussion of the ACT and its uses as a sector HG and as an AM are provided in section 0.

3.4 Harvest Control Rules

New ABC harvest control rules are contemplated under Amendment 23. The ABC under the No Action alternative is the estimated MSY harvest level and is redefined in the new NS1 guidelines and the Amendment 23 action alternatives as a level of harvest below the MSY harvest level (i.e., OFL) to accommodate the scientific uncertainty in estimating the OFL. Scientific uncertainty was considered in the specification of the OY under the No Action alternative and greater OY buffers were often specified for stock specifications informed by less certain data. In general, the three stock categories under No Action and the action alternatives remain unchanged with category 1 being more certain, assessed stocks, category 2 being data-moderate stocks informed by less quantitative assessments or other information, and category 3 being unassessed stocks. The No Action scientific uncertainty buffers (i.e., difference in yield between the ABC and OY) were generally 0 percent for category 1 stocks, 25 percent for category 2 stocks, and 50 percent for category 3 stocks. However, these buffer amounts are not specified in the FMP; buffers are set in the biennial specifications process according to the FMP principle that scientific uncertainty buffers vary progressively with generally larger buffers for less certain stock categories. The proposed Amendment 23 action does not fundamentally change this process although an explicit scientific uncertainty buffer is proposed in the new Amendment 23 ABC control rule. New methods for quantifying scientific uncertainty and determining ABCs are considered under Amendment 23 and the associated 2011 and 2012 harvest specifications using the new

Amendment 23 harvest specification framework. Analysis of the affect of the new proposed ABC control rules are provided in the 2011-2012 groundfish harvest specifications EIS (PFMC (Pacific Fishery Management Council) and NMFS (National Marine Fisheries Service) 2010).

The proposed ABC control rules under the preferred Amendment 23 alternative include a straight percentage reduction of the OFL to determine a scientific uncertainty buffer and the ABC. This approach is not significantly different from the precautionary adjustments to OYs under the No Action alternative in consideration of scientific uncertainty. The most significant difference is that the proposed Amendment 23 alternative considers scientific uncertainty in setting harvest levels independently of other uncertainties and considerations, which were all part of the OY decision under the existing No Action harvest specification alternative. The ABC control rule using the P* approach is a new one under the Amendment 23 action alternatives. As the SSC noted, the difference between a straight percentage reduction from the OFL and the P* approach when deciding an ABC is that the P* approach allows the Council to express its views and preferences on overfishing risk aversion. All recommended ABCs will require an SSC endorsement as recommended in the revised NS1 guidelines and the preferred Amendment 23 alternative. The process can work either by the SSC recommending the buffers by species category and the Council following that advice or the Council takes the first step in deciding the buffer followed by an SSC evaluation and endorsement that the buffer adequately addresses scientific uncertainty. In the P* approach, the SSC "endorsement" comes from their deciding the assessment uncertainty variance (σ) by stock category. This σ value is mapped to a range of P* values to decide the scientific uncertainty buffer. The Council chooses the P* value as a risk assessment decision to decide the magnitude of the scientific uncertainty buffer. The SSC recommended that P* had to be less than 0.5 since a P* of 0.5 equates to no scientific uncertainty buffer and implies that the OFL is estimated with no uncertainty or error. The Council's decision to only consider P* values up to 0.45 when a P* approach is used to decide an ABC was deemed a satisfactory upper limit by the SSC and constitutes their endorsement of the ABC when the P* approach is used. Where the Council decides to adopt a straight percentage reduction of the OFL to determine the ABC, it will solicit the SSC's endorsement.

The 40-10 harvest control rule options considered under Amendment 23 vary by whether the 40-10 ACL adjustment is made before the ABC adjustment (i.e., Option 1 under Alternative 1, Figure 2-3) or after the ABC adjustment (i.e., Option 2 under preferred Alternative 2, Figure 2-4). Option 1 may be considered the closest to the status quo rule described under the No Action alternative (Figure 2-2) in that the ACL adjustment is made directly off the OFL curve. Under the status quo rule, the OY is adjusted using this harvest control rule from the ABC curve and the proposed preferred Amendment 23 alternative is to redefine the current ABC as the OFL. However, under Option 2, the 40-10 adjustment is made after the scientific uncertainty buffer or the ABC is specified. Therefore, the 40-10 adjusted ACLs under Option 2 will always be lower than the resulting ACLs under the Option 1 rule. An example of resulting 2011 sablefish ACLs under the two 40-10 adjustment options considered during the current biennial specifications process is shown in Table 3-1. Given the OFL and depletion level projected from the most recent sablefish assessment, the resulting ACL under the Option 1 rule is independent of an ABC decision. In this case, the 40-10 adjustment does not affect the resulting ACL under a wide range of P* values between 0.15 and 0.45 since the ACL cannot exceed the ABC. However, under the Option 2 rule, the ABC is decided before the 40-10 adjustment is made resulting in ACLs that are lower and vary by the choice of P*. Option 2 is therefore a more precautionary harvest control rule than Option 1. The Council chose the Option 2 harvest control rule as their preferred alternative under Amendment 23. They further adopted the SSC-recommended 25-5 rule for assessed flatfish species with the same Option 2 structure where the ACL adjustment is made after the ABC control rule is applied as their preferred alternative. The Council's rationale for the Option 2 ACL harvest control rule(s) was that the 40-10 adjustment (and the new 25-5 adjustment) was never intended to address scientific uncertainty as the new ABC specification is intended, but is intended to rebuild

stocks to target biomass levels when stock biomass declines below the target. Therefore, the ACL harvest control rule should be applied independently of the ABC control rule as is the case with the Option 2 rule.

Table 3-1. Coastwide 2011 sablefish ACL alternatives under the two 40-10 adjustment options considered under Amendment 23.

2011 OFL (mt)	8,808						
2011 depletion	36.0%						
	Overfishing Probability (P*)						
	0.45	**0.40**	**0.35**	**0.30**	**0.25**	**0.20**	**0.15**
2011 ABC (mt)	8,418	8,040	7,667	7,293	6,909	6,506	6,065
2011 ACL under option 1 40-10 adj				8,485			
2011 ACL under option 2 40-10 adj	7,863	7,510	7,161	6,812	6,453	6,077	5,665

3.5 Species Managed in the FMP

The NS1 guidelines suggest that the Council set ACLs for target stocks, any non-target stocks that are overfished, or those non-target stocks potentially vulnerable to overfishing. The GMT analyzed the vulnerability of each stock in the FMP with a Productivity and Susceptibility Assessment (reported in Agenda Item E.2.b, Supplemental GMT Report, April 2010, which is available online at http://www.pcouncil.org/resources/archives/briefing-books/march-2010-briefing-book/#groundfish). Based on that analysis, the GMT did not recommend removing any species from the FMP other than dusky and dwarf-red rockfish. These two species were included in the FMP based on very few occurrences. Dusky rockfish are distributed to the north of the U.S. west coast EEZ. There are records of only a few fish being landed into Washington. There is only one occurrence of dwarf-red rockfish in the Channel Islands when two individuals were observed following a Navy underwater demolition. The GMT concluded that setting an ACL for these species would serve no purpose and therefore the Council recommended removing these two species from the FMP under their preferred Amendment 23 alternative.

The GMT also evaluated the current stock complexes by looking at latitudinal and depth distributions of FMP species, vulnerability scores from the above cited PSA analysis, and fishery interactions of each species currently managed within a complex. This analysis showed that improvements can be made in the composition of the stock complexes. Such changes include rearranging current complexes and possibly adding other species into the FMP and consideration for constructing the complexes around indicator species. The GMT concluded that the analyses needed to create ACLs for any new or reconfigured complexes are not likely feasible within the short timeframe for Amendment 23.

The Other Fish complex is of most concern to the GMT given the lack of a quantitative basis for its current harvest specifications and the relatively high vulnerability of its component elasmobranch species. Preliminary discussions have identified various alternatives for decomposing this complex into a few new stock complexes.

In November 2009, the Council gave lower priority to the GMT's suggestion to evaluate species not in the FMP. Using publically available WCGOP reports on the non-whiting trawl fishery in 2007 and 2008, and a simple method for expanding total catch, the GMT was able to roughly compare the relative magnitude of total catch of FMP species versus species not in the FMP. As shown in Table 3-2, some species not in the FMP are caught in greater amounts than FMP species. It is clear that the vulnerability scores of these species would be indistinguishable from those of the current FMP species. The GMT concluded they could not complete the necessary analyses and discussion to fully implement the

changes to stock complexes suggested by the NS1 guidelines on the timeline for implementing Amendment 23. They recommended revisiting the "in the fishery" classification following this biennial cycle and consider these changes to stock complexes in the 2013-2014 cycle.

Table 3-2. Estimated total catch of select FMP and non-FMP species in the non-whiting trawl fisheries, 2007 and 2008.

Other Flatfish	2007	2008
butter sole	0.7	0.3
curlfin sole/turbot	8.8	1.8
flathead sole	4.0	1.2
Pacific sanddab	395.9	235.1
rex sole	647.3	459.2
rock sole	8.3	0.1
sand sole	21.7	11.9
Non-FMP Flatfish	**2007**	**2008**
Deepsea sole	43.1	76.5
Slender sole	45.1	21.6

Select Other Fish	2007	2008
big skate	123.2	51.6
California skate	7.2	5.9
finescale codling/Pacific flatnose	14.7	4.7
Pacific rattail/grenadier	183.7	81.3
ratfish	183.7	169.9
Non-FMP Skates	**2007**	**2008**
Aleutian skate	5.9	14.0
Black skate	61.0	128.3
Other & Unidentified skate	422.2	308.2
Non-FMP Sharks	**2007**	**2008**
Brown cat shark	33.0	50.2
Shark (unidentified)	16.9	28.7
Non-FMP Grenadiers	**2007**	**2008**
Giant grenadier	265.4	144.8
Other & Unidentified grenadier	3.3	15.6

3.6 Species Categories

The three species categories in the existing FMP and described under the No Action alternative are maintained under the Council's preferred Amendment 23 alternative. Additionally, a fourth category of Ecosystem Component species is recommended to be incorporated in the FMP as recommended in the revised NS1 guidelines and under the Council's preferred Amendment 23 alternative. However, based on the GMT's recommendation, no FMP species are recommended to be categorized as EC species under Amendment 23. The GMT was generally in favor of their inclusion but was not prepared to do so until a better understanding of how designation of EC species might benefit management and a more thorough consideration of species both in and out of the FMP as potential EC species is done. The GMT recommended deferring any EC species designation to the next management cycle. It is therefore anticipated that a trailing amendment to Amendment 23 will be developed during the 2013-14 biennial specifications decision making process to consider adding new species to the FMP, refining the current structure of stock complexes, and designating some FMP species as EC species.

3.7 Status Determination Criteria

There is no significant difference in the SDC described in the existing FMP (i.e., under the No Action alternative) relative to the amended FMP as recommended under the Council's preferred Amendment 23 alternative since the existing SDC are the recommended SDC in the revised NS1 guidelines. The only difference in the Preferred and No Action alternatives is the redefinition of the ABC to the OFL as recommended in the revised NS1 guidelines.

3.8 Accountability Measures

The existing AMs (e.g., inseason catch monitoring and adjustments) are recommended in the revised NS1 guidelines and are maintained under the Council's preferred Amendment 23 alternative. The Council also recommends incorporating the use of the ACT as an AM to keep from exceeding ACLs as recommended in the revised NS1 guidelines by directly addressing management and catch monitoring uncertainty.

Current regulations at §600.310(e)(3)(v)(C) require that fishing mortality be counted against the OY, including mortality resulting from bycatch, scientific research, and other fishing activities. Specifically, these "off-the-top" deductions are used to account for groundfish mortality in tribal fisheries, incidental open access fisheries (e.g., non-groundfish fisheries that impact groundfish stocks), scientific research, and removals under exempted fishing permits (EFPs). Under the proposed FMP Amendment 23 these sources of fishing-related mortality are deducted from either the ACL or ACT; this decision and the corresponding impacts are analyzed during the biennial specifications process. In some instances, the Council may wish to treat the ACT like the ACL and subtract the off-the-top deductions from the ACT prior to determining sector allocations. In other cases, for example, if sector-specific ACTs are used, then the off-the-top deductions may be taken from the ACL prior to calculating the ACT.

3.8.1 *Background and Analysis of Existing Accountability Measures in Consideration of Adding the ACT to the Harvest Specification Framework in the FMP*

The new NS1 guidelines recommend effective AMs to keep from exceeding specified ACLs. The guidelines recommend consideration for a further yield buffer, termed the ACT, which can be set below the ACL if there is great uncertainty in the ability of the management system to effectively keep total fishing mortality below the prescribed ACL. The NS1 guidelines recommend an ACT does not need to be specified in the FMP if there are effective AMs, such as an inseason monitoring program, that can be demonstrated to keep harvest below the ACL. The performance standard recommended in the new NS1 guidelines for AMs is ACLs cannot be exceeded more often than once in four years.

The performance of the current management system was evaluated to determine if there are stocks and/or instances where an ACT may need to be specified. The current management system has evolved since 2002 with the advent of the West Coast Groundfish Observer Program (WCGOP) and better tracking of discard mortality. The Groundfish Management Team (GMT) has been using a report provided by the Pacific Fisheries Information Network (PacFIN) called the Quota Species Monitoring (QSM) report to track commercial landings of stocks and stock complexes managed under OYs or harvest guidelines. The GMT and the states track discard mortality of these species which are also posted on the QSM report based on impact projection models developed by the GMT and the NMFS Northwest Fisheries Science Center that associates species' discards with landings of target species using bycatch rates obtained from the WCGOP. The QSM is updated every two weeks and a program within PacFIN tracks total catches (landings plus discard mortalities) for monitored species relative to past years' catches. A companion program that tracks recreational catches is maintained on the Recreational Fisheries Information Network (RecFIN) and is used by the GMT and the states to track that catch component, ensuring that all catches are counted against annual harvest specifications to better ensure these catch limits are not exceeded.

Total catch estimates of stocks and stock complexes with specified OYs were compared with the specified OY during 1999-2008 to evaluate the effectiveness of the current management system to stay within specified OYs. This period was used since total catch OYs, where all sources of fishing-related

mortality are counted against the OY, were specified beginning in 1999[2]. The analysis extends through 2008 since this is the most recent year with an available total mortality report from the NMFS Northwest Fisheries Science Center. Table 3-3 depicts those instances when the annual total catch of a species has exceeded the specified OY.

Table 3-3. Instances when groundfish OYs have been exceeded in the recent management period, 1999-2008.

Species	Year OY was exceeded	Specified total catch OY (mt)	Estimated total catch (mt)	Percent of OY overage
Bocaccio	2000	100	112.0	12.0%
	2001	100	109.0	9.0%
Cabezon (CA)	2004	69	101.8	47.5%
	2005	69	85.4	23.8%
Canary	2001	93	133.0	43.0%
	2002	93	98.1	5.5%
	2003	44	59.9	36.1%
	2004	47	50.3	6.3%
	2005	47	60.4	29.1%
	2006	47	62.0	31.9%
	2007	44	44.7	1.6%
Darkblotched	2001	130	274.0	110.8%
	2002	168	179.0	6.5%
	2004	240	252.0	5.0%
Dover sole	2005	7,476	7,507.0	0.4%
	2006	7,564	7,730.0	2.2%
Petrale sole	2005	2,762	2,960.0	7.2%
POP	2001	303	307.0	1.3%
	2007	150	156.0	4.0%
Shortspine	1999	805	1,001.0	24.3%
	2000	970	1,037.0	6.9%
	2002	955	960.0	0.5%
	2003	955	1,014.0	6.2%
Sablefish (coastwide)	2008	5,934	6,078.0	2.4%

Prior to implementing rockfish conservation areas (RCAs) in 2003, which closed the core areas to groundfish fishing where overfished species occur, it was more difficult to manage fishery impacts to the low OYs prescribed in rebuilding plans. This led to higher magnitude OY overages prior to RCA management. Also, the precision of impact projection models has improved since 2003 as more WCGOP data became available to inform these models with more representative bycatch rates. These two factors and an adaptive management process where the GMT and Council have learned which management measures (e.g., RCA configurations and cumulative landing limits) work best under rebuilding regimes has led to improved management performance in recent years. However, there has been a persistent problem in managing the low canary rockfish OYs. Also, there have been instances where OYs for other species were exceeded in more recent years that require further explanation.

The canary rockfish management challenge has been extreme. This species is caught in all groundfish fisheries by a variety of gears and has therefore been one of the most constraining stocks limiting

[2] Prior to 1999, landed catch OYs were specified where only landings and not discard mortalities were counted against the OY.

fishing opportunities since it was declared overfished in 2000. It is also apparent that the patterns of canary rockfish distribution, both seasonally and from year to year, are relatively unpredictable. The impact projection model used for the limited entry trawl fishery does a relatively good job of predicting impacts for the overfished species; however, there has always been a problem projecting canary rockfish impacts with relative precision. The lack of real-time reporting of canary discards in the trawl fishery has led to a reliance on the impact projection model. The imprecision of that model has led to a persistent problem of exceeding the specified canary rockfish OY despite increasingly stringent management measures imposed on the trawl fleet (e.g., shelf area closures north of Cape Alava and between Humbug Mt. and Cape Arago). Further, recreational catch projections are also relatively uncertain and canary rockfish are readily caught as bycatch in coastwide recreational fisheries as well. Therefore, current catch monitoring systems and impact projection models have failed to adequately perform in managing fishery impacts within canary rockfish OYs.

Other species' OY overages are a little more easily explained and the result of either human error (e.g., petrale sole in 2005 and sablefish in 2008), poor catch monitoring systems that have since been improved (e.g., bocaccio in 2000 and 2001), or a relatively rare and unexpected bycatch event (e.g., POP in 2007).

For example, the petrale sole OY was exceeded in 2005 due to human error. The petrale catch had been higher than normal during the first half of the year; however, managers were not paying adequate attention to this fact and did not react in time. It was realized over the summer that the petrale catch was projected to exceed the OY by a significant amount. In September, the Council reacted by closing the fishery and was able to mitigate this management miscue by minimizing the OY overage. The sablefish overage was also due to human error. The GMT's examination of the sablefish catch overage indicated there was a coding error in the QSM system that resulted in approximately 400 mt of catch going unreported inseason. As such, cumulative limit adjustments during 2008 were based on underestimated catch and resulting in the higher impacts. The GMT was able to confirm with PacFIN staff that the coding error was corrected and that this affected QSM reported catch for sablefish, longspine, and shortspine thornyheads in 2008, although only the sablefish OY was exceeded.

The bocaccio OY overages in 2000 and 2001 were due to recreational catches exceeding projections due largely to a very imprecise recreational census program called the Marine Recreational Fisheries Statistical Survey (MRFSS). The MRFSS program was designed to gauge gross catch and effort trends in marine recreational fisheries nationwide and it did not have the precision necessary for inseason management. However, MRFSS catch estimates were the best available data, so the Council and NMFS used them for management decision-making. The imprecision of MRFSS for monitoring recreational catch stems from the fact that effort is tracked through a telephone survey of coastal residents nationwide leading to highly uncertain and variable effort estimates that were used in California for estimating recreational catch. This lack of precision and the difficulty managing recreational fishery impacts using MRFSS led to the implementation of the California Recreational Fisheries Survey (CRFS) in 2004, which bolsters catch sampling and surveys effort using the California angler license frame. Since the implementation of CRFS, estimated catches of recreationally important species in California such as bocaccio have been more certain and recreational impact projections more precise.

The POP OY overage in 2007 was the result of one high landing in the shoreside whiting fishery at the end of the year. There was a hiatus in the whiting fishery that year when the widow total catch limit was attained prior to attaining whiting quotas. The fishery was shut down in July and re-opened in October when available widow yield was added to the total catch limit by the Council and NMFS. However, there was concern that the canary total catch limit would be exceeded that fall without a mitigating management restriction on the fishery. Therefore, the Council and NMFS re-opened the fishery with a 150 fm depth restriction, which forced the fleets to fish in deeper waters than they

normally fished to avoid canary. The shoreside whiting vessel that had the high POP catch was consequently operating in waters unfamiliar to the skipper at a time when the shoreside whiting fishery would not normally be open. This bycatch event that led to the POP OY overage was therefore not anticipated and occurred too late in the season to react to with an inseason adjustment to the fishery.

The other instances of species OY overages depicted in Table 3-3 (i.e., those for darkblotched, Dover sole, and shortspine thornyheads) were due to trawl catches that exceeded projections (these are all trawl-dominant species). Some of these overages occurred late in the season from effort that was higher than projected and other overages were due to imprecise trawl bycatch projections from modeling non-representative bycatch rates, especially early in the period depicted in Table 3-3. Management decisions subsequent to these OY overage instances adapted from these miscues with better understanding of expected catch and effort late in the season under a range of management measures.

The performance standard of not exceeding total catch limits more often than once in four years on average has clearly not been met for all groundfish species. For this reason, the Council elected to add the ACT as another AM to ensure ACLs are not exceeded in the future. While there may be no compelling reason to specify an ACT for most groundfish stocks, it is clear that it may be an important AM for a stock like canary rockfish under our current management system.

There are anticipated improvements to the management system that may make it less necessary to add the ACT to the FMP. The trawl fishery under the preferred alternative for Amendment 20 rationalization will have 100% observer coverage and real-time reporting of all catch, including discard mortality. This is a significant improvement in trawl catch monitoring and will eliminate management reliance on the trawl bycatch model and is a very precise AM for this fishery, which has historically had the highest groundfish bycatch. Trawl allocations will not likely be exceeded and, for the trawl-dominant species in Table 3-3 (i.e., all species other than bocaccio, cabezon, and canary), total catch limits will not likely be exceeded under the trawl rationalization program. However, the ACT may still be a useful AM for species like bocaccio, cabezon, and canary that are caught significantly in recreational fisheries. Catch estimation and projection in recreational fisheries is relatively uncertain and an ACT may be a reasonable measure for managing recreational impacts given this management uncertainty.

There are also other potential uses for the ACT. Since the ACT is a target and not a total catch limit, the ACT can be exceeded without penalty. Therefore, the ACT could be specified in a rebuilding strategy where the ACL defines the limit of acceptable fishing related mortality under a rebuilding plan and the ACT can be set lower in an attempt to get the fishery to perform better at avoiding the overfished species. For instance, the Council and NMFS have decided rebuilding strategies for bocaccio in the past where OYs were specified according to the adopted rebuilding plan, but the Council and NMFS stated a management intent to do better than that and set a target impact less than the OY. Likewise, the 2009-2010 rebuilding strategy for canary rockfish was to maintain the target harvest rate prescribed in the Amendment 16-4 rebuilding plan (the SPR harvest rate in the rebuilding plan projected a 155 mt OY in 2009 and 2010), but to set OYs under a lower harvest rate (i.e., 105 mt in 2009 and 2010). In both the bocaccio and canary cases, the ACL could be specified according to the rebuilding plan harvest rates and a lower ACT could be specified to attempt a more aggressive rebuilding strategy than prescribed in the adopted rebuilding plan. Given the management uncertainty associated with trying to balance conservation and socioeconomic objectives in a rebuilding plan (i.e., trying to rebuild overfished species in as short a time as possible while considering socioeconomic impacts on fishing communities), the strategic use of the ACT may be helpful.

The ACT may also be a helpful AM for species with relatively high rates of discard. Discard estimates tend to be highly variable from year to year and there is about a year and a half lag before discard

mortality is reported in the total mortality reports provided by the NMFS Northwest Fisheries Science Center. Therefore, the uncertainty associated with high rates of discard mortality could be addressed by specifying an ACT. While this uncertainty is expected to be addressed for the trawl sectors under trawl rationalization, there are still some species such as arrowtooth flounder, spiny dogfish, and skates that are discarded at a relatively high rate in some limited entry and open access fixed gear fisheries. Such species may be good candidates for an ACT specification.

Finally, the ACT could be used as an HG in groundfish management as described in section 2.2.6 since both specifications are annual catch targets and not limits. The new NS1 guidelines suggest ACTs could also be specified as sector-specific targets, which is analogous to the current use of harvest guidelines in groundfish management. The GMT discussed this aspect of managing with ACTs at their October 2009 meeting, including the potential of supplanting the current use of a harvest guideline in the FMP with the ACT. In concept, this was considered a reasonable Amendment 23 consideration. However, one practical impediment to this action is the California statute that says in effect that CDFG can close or modify fishing seasons and/or pursue other management actions to prevent exceeding a federally-specified OY or harvest guideline[3]. Unless the statute is amended to allow such an automatic agency action (i.e., without a decision from the California Fish and Wildlife Commission, which is a more protracted process), redefining the harvest guideline as the ACT in the FMP may be untenable. However, such a change in the California statute may be needed anyway to allow automatic agency action to prevent exceeding a federally-specified ACL.

[3] The Washington and Oregon Departments of Fish and Wildlife already have relatively broad authority from their respective commissions to automatically close or modify their fisheries.

LITERATURE CITED

PFMC (Pacific Fishery Management Council). 2008. Status of the Pacific Coast Groundfish Fishery: Stock Assessment and Fishery Evaluation. Portland, Oregon: Pacific Fishery Management Council. Volume 1.

PFMC (Pacific Fishery Management Council) and NMFS (National Marine Fisheries Service). 2010. Proposed Harvest Specifications and Management Measures for the 2011-2012 Pacific Coast Groundfish Fishery and Amendment 16-5 to the Pacific Coast Groundfish Fishery Management Plan to Update Existing Rebuilding Plans and Adopt a Rebuilding Plan for Petrale Sole; Draft Environmental Impact Statement Including Regulatory Impact Review and Initial Regulatory Flexibility Analysis. Portland, Oregon: Pacific Fishery Management Council.