

EXECUTIVE SUMMARY

ES.1.0 INTRODUCTION

ES.1.1 How This Amendment is Organized

This document provides background information about and analysis of changes to the Pacific Coast Groundfish Fishery Management Plan incorporated as Amendment 16-3. The actual changes, or amended parts of the plan, will appear in the final environmental impact statement. The Pacific Fishery Management Council (Council) prepared this document. The Council is one of eight regional Fishery Management Councils providing management recommendations to NMFS, which then implements these regulations through federal regulations as appropriate. The Pacific Fishery Management Council is responsible for fisheries occurring in federal waters off the U.S. West Coast. Each Council draws its membership from constituent states; in addition to Washington, Oregon, and California, Idaho is also a member of the Pacific Council because salmon, managed by the Council under a different fishery management plan, return to rivers in Idaho to spawn.

This document is the third in a series of amendments numbered Amendments 16-1, 16-2, and 16-3. Amendment 16-1, approved on November 14, 2003, establishes a framework for the adoption of rebuilding plans for overfished species. Amendment 16-2, approved on January 30, 2004, adopted rebuilding plans for darkblotched rockfish, Pacific ocean perch (POP), lingcod, and canary rockfish. This amendment adopts rebuilding plans for bocaccio, cowcod, widow rockfish, and yelloweye rockfish. Adopted plans are implemented through the framework contained in Amendment 16-1.

FMPs, and any amendments to them, must conform to the Magnuson-Stevens Act (MSA), the principal legislation governing fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 nautical miles from shore. In addition to addressing MSA mandates, this document is an EIS, pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. According to NEPA (Sec. 102(2)(C)), any “major federal action significantly affecting the quality of the human environment” must be evaluated in an EIS. Based on a preliminary determination by Council and NMFS staff, adopting these four rebuilding plans may have significant impacts. Therefore, rather than preparing an environmental assessment (EA), which provides “sufficient evidence and analysis for determining whether to prepare an environmental impact statement,” NMFS and the Council have decided to proceed directly to preparation of an EIS. The document also contains information and analyses relevant to the Regulatory Flexibility Act (RFA) and Executive Order (EO) 12866 (Regulatory Impact Review or RIR). These mandates require agencies to evaluate the economic impact of regulatory actions, especially on small entities.

Federal regulations (40 CFR 1502.9) require agencies to prepare and circulate a draft EIS (DEIS), which “must fulfill and satisfy to the fullest extent possible the requirements established for final statements in Section 102(2)(C) of the Act” (i.e., NEPA). Agency guidelines (NOAA Administrative Order 216-6.5.01.b.1(i)) stipulate a minimum 45-day public comment period on the DEIS. At the end of this period a final EIS (FEIS) is prepared, responding to comments and revising the document accordingly. After the EIS is completed, a 30-day “cooling off” period ensues—with another opportunity for public comment—before the responsible official may sign a record of decision (ROD) and implement the proposed action. NMFS and the Council are under a court-mandated deadline of September 15, 2004, to sign the ROD for this EIS and approve the FMP amendment, signaling implementation of the rebuilding plans. In order to meet this deadline, in concert with the Council meeting schedule and other staff obligations, the DEIS for this action was released in advance of the Council recommending a preferred alternative, which they did on April 8, 2004, at their April meeting in Sacramento, California. This preferred alternative is within the range of

alternatives described and evaluated in the DEIS. A 45-day public comment period on the DEIS ended on May 24, 2004. In addition to responding to public comments, this FEIS incorporates additional analysis needed to fully evaluate the Council's preferred alternative.

Environmental impact analyses have four essential components: a description of the purpose and need for the proposed action, a set of alternatives that represent different ways of accomplishing the proposed action, a description of the human environment affected by the proposed action, and an evaluation of the predicted direct, indirect, and cumulative impacts of the alternatives.^{1/} These elements allow the decisionmaker to look at different approaches to accomplishing a stated goal and understand the likely consequences of each choice or alternative. EISs are commonly organized around four chapters covering each of these topics. This EIS is organized differently; Chapters 1 and 2 cover the purpose and need and describe the alternatives, but the next six chapters focus on parts of the human environment potentially affected by the proposed action. Each of these chapters describes both the baseline environment potentially affected by the proposed action and the predicted impacts of each of the alternatives. Appendices A, B, and C provide additional supporting information. Appendix A is a comprehensive description of the affected environment and supports the descriptions included in Chapters 3 through 8. Appendix B reproduces tables first developed for Amendment 16-2 showing the catch of overfished species by different fleet segments and the co-occurrence of target species and overfished species. Appendix C describes fisheries income impact modeling methodology used in the socioeconomic impacts analysis. Appendix D contains the amendatory language that will be added to the Groundfish FMP as part of this action. Appendices E through H are the species rebuilding plans.

ES.1.2 Purpose and Need

ES.1.2.1 The Proposed Action

The proposed action is to implement legally-compliant rebuilding plans, consistent with the framework established in Amendment 16-1, that will set strategic rebuilding parameters to guide stock rebuilding for bocaccio (*Sebastes paucispinis*), cowcod (*S. crameri*), widow rockfish (*S. entomelas*), and yelloweye rockfish (*S. ruberimus*). These rebuilding parameters stem from the MSA and National Standard 1 guidelines (50 CFR 600.310). The most important strategic rebuilding parameters are the time period within which the stock must be rebuilt to the target biomass capable of supporting MSY and the harvest control rule that would constrain fishing mortality so that the stock can be rebuilt in that time period. Amendment 16-1, addressing the process and standards for rebuilding plan adoption, states that new management measures intended to achieve these targets may be added to the FMP as part of rebuilding plans. However, no new management measures are proposed in Amendment 16-3 (evaluated in this EIS); instead, existing management measures implemented through the biennial management process will be used to constrain fishing to the targets identified in the rebuilding plans.

ES.1.2.2 Need (Problems for Resolution)

Rebuilding plans are mandated when the size of a stock or stock complex falls below a level described in the FMP as the minimum stock size threshold, or MSST, which is 25% of unfished biomass ($B_{25\%}$) for stocks managed under the groundfish FMP. Diminished stock size may be caused or exacerbated by fishing. Regardless of the cause of the decline, fishing mortality needs to be controlled to prevent further deterioration

1/ Federal regulations at 40 CFR 1502 detail the required contents of an EIS. Although there are several additional components, this list is of the core elements.

in the condition of the stock, and if the stock has been overfished, to allow it to rebuild.^{2/} Amendment 11 to the groundfish FMP established the “status determination criteria” (including MSST) that are used to determine whether overfishing is occurring and whether a stock has reached an overfished state. Rebuilding plans specify how an overfished stock will be rebuilt.

The proposed action is needed, because the four groundfish species addressed by this amendment (bocaccio, cowcod, widow rockfish, and yelloweye rockfish) are overfished. National Standard 1 in the MSA requires conservation and management measures that prevent overfishing. Preventing overfishing also means returning stocks to a size capable of achieving MSY, or to a stock size less than this if such stock size results in long-term net benefit to the nation. In order to satisfy this mandate, legally compliant rebuilding plans must be adopted for stocks that have been declared overfished by the Secretary of Commerce.

ES.1.2.3 Purpose of the Proposed Action

The *purpose* of the proposed action is to rebuild bocaccio, cowcod, widow rockfish, and yelloweye rockfish stocks managed under the Pacific Coast Groundfish FMP to a size capable of supporting MSY, or to a stock size less than this if such stock size results in long-term net benefit to the nation, and according to the requirements of the MSA. The MSA states: “For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations... for such fishery shall... specify a time period for ending overfishing and rebuilding the fishery...” (Sec. 304(e)(4)). The MSA also states that this time period “shall be as short as possible,” and usually may not exceed 10 years. However, in setting a time period for rebuilding the stock, fishery managers may take into account various mitigating factors, such as the biology of the stock and the needs of fishing communities, such that the time period may exceed 10 years. Rebuilding plans must also take into account variations and contingencies in ecological and environmental conditions that cause MSY biomass to vary over time, which affects the practicable time period for rebuilding the stock. (The next section further describes stock rebuilding requirements.)

ES.2.0 Description of the Alternatives

The alternatives are structured around management targets for each of the four overfished species considered in the EIS. These targets are derived from National Standards Guidelines, which specify how rebuilding should occur (50 CFR 600.310(e)). Rebuilding should bring stocks back to a population size that can support MSY (B_{MSY}). A rebuilding plan must specify a target year (T_{TARGET}) based on the time required for the stock to reach B_{MSY} . This target is bounded by a lower limit (T_{MIN}) defined as the time needed for rebuilding in the absence of fishing (i.e., fishing mortality rate $[F] = 0$). Rebuilding plans for stocks with a T_{MIN} less than 10 years must have a target less than or equal to 10 years. If, as is the case with all of the groundfish stocks considered in this amendment, the biology of a particular species dictates a T_{MIN} of 10 years or greater, then the maximum allowable rebuilding time, T_{MAX} , is the rebuilding time in the absence of fishing (T_{MIN}) plus “one mean generation time.”

Because of the uncertainty surrounding stock assessments and future population trends (due, for example, to variable recruitment), the rebuilding period limits and the target need to be expressed probabilistically. At the policy level, this makes the tradeoff between long-term risk and short-term costs explicit. Long-term risk is expressed in terms of the probability the stock will rebuild in the maximum time period (T_{MAX}), given a specified level of harvest during the rebuilding period. If harvest limits are lowered, representing greater

2/ But when environmental changes affect the long-term productive capacity of the stock, one or more components of the status determination criteria may be respecified and the need for a reduction in fishing mortality reevaluated (50 CFR Section 600.310).

short-term costs, this probability (P_{MAX}) increases. Conversely, if a higher harvest rate is chosen, P_{MAX} decreases, representing greater long-term risk the stock will fail to rebuild. The target year is derived from the same computation. For a given harvest rate, T_{TARGET} is the year in which there is a 50% probability the stock will be rebuilt. If catches of an overfished species are prohibited, then T_{TARGET} will be equal to T_{MIN} , the minimum possible rebuilding time. (T_{MIN} is also calculated in a similar way: it is the year with a 50% rebuilding probability, but with the harvest rate set to zero.) Choosing a target year equal to T_{MAX} results in a P_{MAX} equal to 50% since the T_{TARGET} and T_{MAX} are equal.

National Standards Guidelines identify a “mixed-stock complex” exception to the definition of overfishing (50 CFR 600.310(d)(6)), which is applicable to some overfished groundfish species. Different fish assemblages—some with healthy stocks and some with overfished stocks—can co-occur in a mixed-stock complex, and thus, both can be caught simultaneously. An optimum yield (OY) harvest for the healthy stock can result in overfishing the depleted stock. The guidelines allow councils to authorize this type of overfishing in certain circumstances (50 CFR 600.315(d)(6)). However, the Council chose not to consider the mixed-stock exception in developing the alternatives evaluated in this EIS.

Given the framework described above, the alternatives represent different rebuilding strategies for each of the four overfished species, which can be described in terms of a harvest rate and the associated P_{MAX} and T_{TARGET} values. Five alternatives are proposed for evaluation in the Amendment 16-3 EIS; they are described below. Under each alternative a range of values is presented for bocaccio based on three different stock assessment model outputs in the 2003 stock assessment and associated rebuilding analysis (MacCall 2003a; MacCall 2003b), approved for evaluation by the Council. These are models STATc, STARb1, and STARb2. The STARb1 and STARb2 models bracket uncertainty about stock status, based on data from California Cooperative Fishery Investigation (CalCOFI) larval fish surveys and a new recreational fishery catch per unit effort (CPUE) index. The STATc model is a hybrid, incorporating data from all sources. Similarly, a range of values is presented for widow rockfish based on scenarios 7, 8, and 9 in the stock assessment and rebuilding analysis for that species (He, *et al.* 2003a; He, *et al.* 2003b). These model outputs vary due to ranging of the power coefficient for the midwater juvenile fish survey index.

ES.2.1 *The No Action Alternative*

An EIS must consider the alternative of no action. This represents the conditions that would apply if the proposed action or one of its alternatives is not implemented. Although the Council has been managing overfished groundfish species using interim rebuilding plans, comparing the rebuilding strategies to how overfished stocks would be managed according to the existing framework in the FMP is more informative. Under this framework a precautionary management strategy to rebuild stocks to B_{MSY} decreases the OY (or target harvest level) from the ABC using the 40-10 adjustment. The 40-10 adjustment is a linear decrease in the OY from the ABC for spawning stock biomass levels between $B_{40\%}$ (40% of the unfished biomass, a proxy for B_{MSY}) and $B_{10\%}$, at which point the OY is adjusted to zero. This results in a straight line, representing the precautionary reduction, intersecting the x-axis at $B_{10\%}$ and the line representing the ABC-biomass relationship at $B_{40\%}$ (see Figure ES.1). Conversely, when the stock is rebuilt, or at $B_{40\%}$, the OY would be set equal to the ABC. The harvest control rule is, therefore, a variable harvest rate based on the stock's biomass relative to its initial, unfished biomass. The parameters used to describe rebuilding strategies can be computed for the harvest rates resulting from application of the 40-10 precautionary reduction, as shown below. In comparison to the other alternatives, the precautionary strategy can result in much lower OYs in the short term, if the overfished stock is at a low biomass level, but allow greater harvests at higher biomass levels, making full recovery less likely. The strategic rebuilding parameters and projected 2005 OY for each species under this alternative are presented in the following table.

Stock	Strategic Rebuilding Parameters		
	F rate (2005 OY)	P _{MAX}	T _{TARGET}
Bocaccio			
STATc (base model)	varies (7 mt)	77.6%	2025
STARb1	varies (67 mt)	90.4%	2019
STARb2	varies (0 mt)	83.7%	2026
Cowcod	varies (0 mt)	NA	NA
Widow Rockfish			
Model 8 (base model)	varies (1,359 mt)	0%	>2102
Model 7	varies (1,016 mt)	0%	>2102
Model 9	varies (1,799 mt)	0%	>2102
Yelloweye Rockfish	varies (27 mt)	0%	>2351

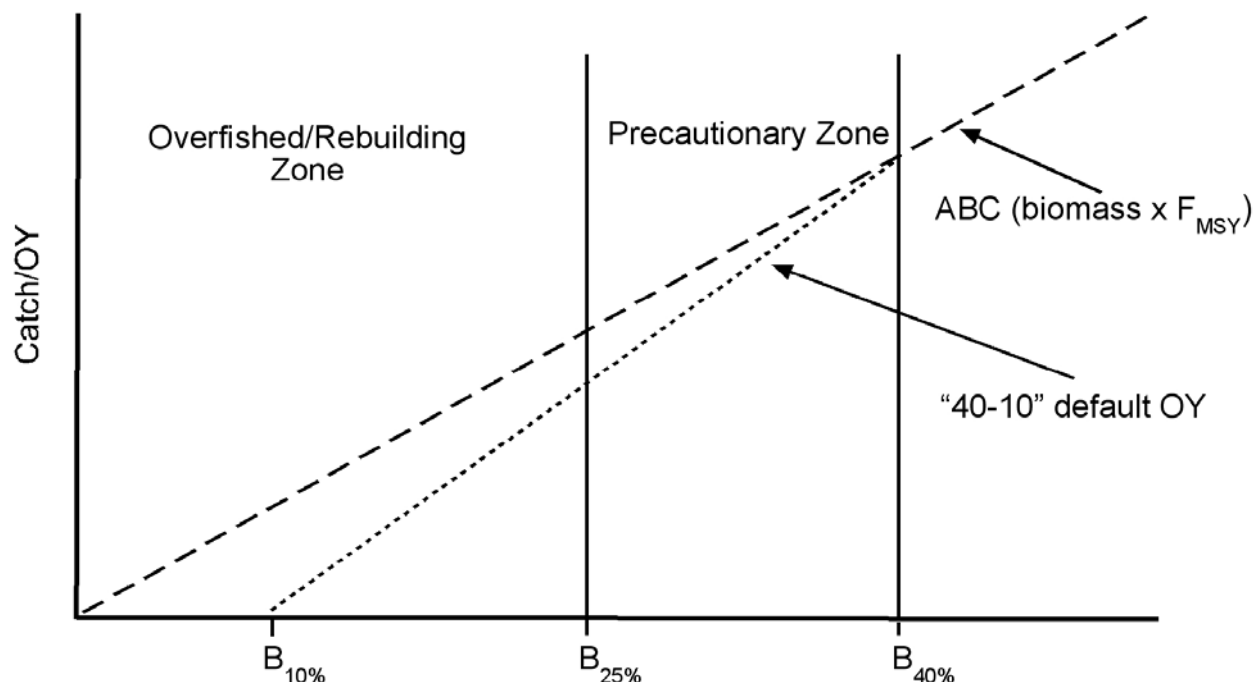


FIGURE ES.1. The 40-10 precautionary adjustment.

ES.2.2 Action Alternative 1

Action Alternative 1 generally specifies the most liberal, legally-compliant harvests considered by the Council for rebuilding these four species. While this action alternative may constrain fisheries less than the other alternatives considered, it does entail the highest risk of not rebuilding by T_{MAX}. Therefore, it has the lowest short-term negative economic impacts to fisheries and fishing communities and the highest biological risk to these overfished stocks. The strategic rebuilding parameters and projected 2005 OY for each species under this alternative are presented in the following table.

Stock	Strategic Rebuilding Parameters		
	F rate (2005 OY)	P _{MAX}	T _{TARGET}
Bocaccio			
STATc (base model)	0.0615 (375 mt)	60%	2025
STARb1	0.0914 (713 mt)	60%	2027
STARb2	0.0643 (304 mt)	60%	2031
Cowcod	0.0100 (4.8 mt)	55%	2095
Widow Rockfish			
Model 8 (base model)	0.0093 (285 mt)	60%	2038
Model 7	0.0067 (180 mt)	60%	2039
Model 9	0.0146 (505 mt)	60%	2034
Yelloweye Rockfish	0.0167 (28 mt)	60%	2067

ES.2.3 Action Alternative 2

Action Alternative 2 is one of the two intermediate action alternatives considered by the Council in November 2003 for detailed analysis in this EIS. Short-term negative socioeconomic impacts to fishermen and fishing-dependent communities are greater than those under Action Alternative 1, but less than those specified under the other action alternatives. Consequently, the risk of not rebuilding by T_{MAX} is less than Action Alternative 1, but greater than the other action alternatives. The strategic rebuilding parameters and projected 2005 OY for each species under this alternative are presented in the following table.

Stock	Strategic Rebuilding Parameters		
	F rate (2005 OY)	P _{MAX}	T _{TARGET}
Bocaccio			
STATc (base model)	0.0498 (307 mt)	70%	2023
STARb1	0.0801 (633 mt)	70%	2024
STARb2	0.0541 (259 mt)	70%	2029
Cowcod	0.009 (4.2 mt)	60%	2090
Widow Rockfish			
Model 8 (base model)	0.0070 (213 mt)	70%	2035
Model 7	0.0041 (111 mt)	70%	2035
Model 9	0.0122 (423 mt)	70%	2031
Yelloweye Rockfish	0.0161 (27 mt)	70%	2062

ES.2.4 Action Alternative 3

Action Alternative 3 is one of the two intermediate action alternatives considered by the Council in November 2003 for detailed analysis in this EIS. Short-term negative socioeconomic impacts to fishermen and fishing-dependent communities are greater than those under Action Alternative 1 or 2, but less than those specified under Action Alternative 4. Consequently, the risk of not rebuilding by T_{MAX} is less than Action Alternative 1 or 2, but greater than Action Alternative 4. The strategic rebuilding parameters and projected 2005 OY for each species under this alternative are presented in the following table.

Stock	Strategic Rebuilding Parameters		
	F rate (2005 OY)	P _{MAX}	T _{TARGET}
Bocaccio			
STATc (base model)	0.0383 (240 mt)	80%	2020
STARb1	0.0670 (538 mt)	80%	2022
STARb2	0.0430 (209 mt)	80%	2027
Cowcod	0.009 (4.2 mt)	60%	2090
Widow Rockfish			
Model 8 (base model)	0.0040 (124 mt)	80%	2032
Model 7	0.0011 (30 mt)	80%	2031
Model 9	0.0094 (327 mt)	80%	2028
Yelloweye Rockfish	0.0153 (27 mt)	80%	2058

ES.2.5 Action Alternative 4

Action Alternative 4 generally specifies the most conservative, legally-compliant harvests considered by the Council for rebuilding these four species. While this action alternative may constrain fisheries more than the other alternatives considered, it does entail the lowest risk of not rebuilding by T_{MAX}. Therefore, of the considered action alternatives, Action Alternative 4 has the highest short-term negative economic impacts to fisheries and fishing communities and the lowest biological risk to these overfished stocks. The strategic rebuilding parameters and projected 2005 OY for each species under this alternative are presented in the following table.

Stock	Strategic Rebuilding Parameters		
	F rate (2005 OY)	P _{MAX}	T _{TARGET}
Bocaccio			
STATc (base model)	0.0209 (307 mt)	90%	2018
STARb1	0.0496 (407 mt)	90%	2020
STARb2	0.0271 (134 mt)	90%	2025
Cowcod	0.009 (4.2 mt)	60%	2090
Widow Rockfish			
Model 8 (base model)	0.0001 (4 mt)	90%	2028
Model 7*	0 (0 mt)	90%	2030
Model 9	0.0060 (209 mt)	90%	2026
Yelloweye Rockfish	0.0142 (24 mt)	90%	2054

*There is only an 82.8% probability of rebuilding widow rockfish with a zero harvest under Model 7. T_{TARGET} = T_{MIN} in this scenario.

ES.2.6 The Council-Preferred Alternative

The Council chose a preferred alternative at their April 5-9, 2004, meeting in Sacramento, California. The Council-preferred Alternative combines rebuilding strategies for the four species identified in the four action alternatives described in the draft EIS. The strategic rebuilding parameters and projected 2005 OY for each species under this alternative are presented in the following table.

Stock	Strategic Rebuilding Parameters		
	F rate (2005 OY)	P _{MAX}	T _{TARGET}
Bocaccio (STATc model)	0.0498 (307 mt)	70%	2023
Cowcod	0.009 (4.2 mt)	60%	2090
Widow Rockfish (Model 8)	0.0093 (285 mt)	60%	2038
Yelloweye Rockfish	0.0153 (26 mt)	80%	2071

ES. 2.7 Alternatives Considered, But Eliminated From Further Detailed Analysis

Any alternatives with less than a 50% probability of rebuilding to B_{MSY} within T_{MAX} are not compliant with the MSA as interpreted in a 2000 Federal Court ruling (*Natural Resources Defense Council v. Daley, April 25, 2000, U.S. Court of Appeals for the District of Columbia Circuit*). Therefore, alternatives with a P_{MAX} less than 50% are not analyzed in this rebuilding plan.

The Council further limited the range of alternatives for detailed analysis at its November 2003 meeting. Those alternatives with a 50% probability of rebuilding to B_{MSY} within T_{MAX} , as well as those alternatives with a 0% fishing mortality rate, were rejected from detailed analysis.^{3/} A 50% rebuilding probability was considered too risky a long-term rebuilding strategy for any of these species, while the economic harm to West Coast fisheries and fishing communities resulting from a zero fishing strategy was considered too high a cost to pay to rebuild these stocks.

As noted above, councils may consider the mixed-stock exception in multispecies fisheries where bycatch is unavoidable. However, the Council chose not to consider alternatives based on this provision.

Lastly, there is a limited range of cowcod alternatives for analysis. Cowcod was the first of the overfished West Coast groundfish stocks so declared after adoption of FMP Amendment 11, which was responsive to the mandates of the 1996 Sustainable Fisheries Act. Many of the tools used to analyze rebuilding effects, such as the Punt rebuilding program (Punt 2002), were not available when this stock was last assessed in 1999, and a rebuilding analysis was prepared. Coupled with the data limitations in the assessment, cowcod stock status is poorly estimated, and the typical suite of rebuilding projections are unavailable. Consequently, there is no way, short of conducting a new assessment, to analyze alternatives with probabilities of rebuilding to B_{MSY} within T_{MAX} greater than 60%. A full stock assessment is scheduled to be conducted for cowcod in 2005, after which alternatives with probabilities greater than 60% may be analyzed for management beginning in the 2007-2008 groundfish management cycle.

ES.3.0 Impacts of the Alternatives

Chapters 3 through 8 in this EIS evaluate impacts of the alternatives to different components of the human environment. In each chapter the baseline condition of the subject environmental component is described. (Appendix A provides more detailed descriptions of the affected environment for West Coast groundfish.) The projected impacts of the alternatives are then evaluated. These projected impacts of the No Action Alternative and Alternatives 1 through 4 are summarized below and in Table ES-1. These were the alternatives in the DEIS, which the Council considered when identifying the preferred alternative. Table ES-2

3/ One exception is the Action Alternative 4 for widow rockfish under the assumption that Model 7 represents the true state of nature. This scenario specifies a zero harvest and harvest rate with an estimated 82.8% probability of rebuilding by T_{MAX} .

summarizes the environmental impacts of the Council-preferred Alternative in relation to each of the four overfished species addressed in this EIS.

ES.3.1 Impacts to Habitat and Ecosystem

Impacts to essential fish habitat and the fishery ecosystem are presumed to be related to the intensity and location of fishing effort. Impacts are likely to be greater in areas where fishing effort is concentrated, and effects differ among the various gear types used in fisheries managed under the Groundfish FMP. Currently, the information necessary to determine the location and intensity of fishing effort, and the correlation between fishing activities and impacts, is unavailable. Generally, alternatives that may result in a higher level of fishing effort are likely to result in greater impacts to habitats and ecosystems. It is presumed that alternatives resulting in higher harvest rates (OYs) will allow greater fishing effort. In the short term, the No Action Alternative results in very low harvest rates for the four species whose rebuilding plans are evaluated in this EIS. In the long term, harvest rates could be higher than under the other alternatives. The action alternatives are likely to allow diminishing levels of fishing effort when ranked from Alternative 1 to Alternative 4. The Council-preferred Alternative combines rebuilding strategies from Alternatives 1, (widow rockfish), Alternative 2 (cowcod and bocaccio), and Alternative 3 (yelloweye rockfish). In relative terms, the impacts resulting from the Council-preferred Alternatives are likely to be intermediate in comparison to Alternatives 1 through 4. The information necessary to predict the location and intensity of impacts to habitat and ecosystems is currently unavailable. NEPA regulations at 40 CFR 1502.22 provide guidance on evaluating “reasonably foreseeable adverse effects” when there is incomplete or unavailable information. The discussion of effects on habitat and ecosystem in Chapter 3 of this EIS follows this guidance.

ES.3.2 Impacts to Protected Species

The impacts of the alternatives to protected species, such as salmon, seabirds, turtles, and marine mammals, are evaluated in the same way as impacts to habitat and ecosystem. Changes in fishing effort intensity and distribution are inferred and used as a basis for predicting impacts. The proposed action will mainly affect recreational fishing in Central and Southern California, in order to rebuild bocaccio and cowcod, and the midwater Pacific whiting fishery, which is concentrated off the Oregon and Washington coasts in order to rebuild widow rockfish. Recreational fisheries are thought to have negligible effects on protected species. Trawl fisheries have an incidental take of marine mammals, although West Coast groundfish fisheries are listed in Category III under the Marine Mammal Protection Act (MMPA), denoting a remote likelihood of serious injuries or mortalities to marine mammals. Of the marine mammal species possibly taken in trawl fisheries, the Stellar sea lion is listed as depleted under the MMPA, and threatened under the Endangered Species Act. The Pacific whiting fishery also incidentally takes salmon stocks listed under the Endangered Species Act. This incidental take is permitted and managed pursuant to a Biological Opinion issued by NMFS. Seabirds are more commonly incidentally caught by longline gear, during deployment. Interactions with protected species could increase under the No Action Alternative over the long term. Harvest levels required under Alternatives 3 and 4 are likely to require substantially restricting or eliminating the Pacific whiting fishery, and under Alternative 4, other groundfish fisheries which catch widow rockfish. As noted, the Council-preferred Alternative incorporates rebuilding strategies for the different species from Alternatives 1 through 4 with targets that are generally intermediate in the range encompassed by these alternatives. The impact of the Council-preferred Alternative on protected species is not predicted to differ substantially from the impacts experienced in 2003. Information on the location and intensity of fishing effort in relation to the distribution of protected species would be necessary to predict the absolute effect of the alternatives on protected species. As discussed above for habitat and ecosystem, NEPA regulations at 40 CFR 1502.22 provide guidance on how to evaluate the reasonably foreseeable adverse effects of alternatives when there is incomplete or unavailable information. The discussion of protected species in Chapter 4 of this EIS follows that guidance.

ES.3.3 Impacts to Overfished Species Subject to Rebuilding Plans Evaluated in this EIS

Impacts to the four overfished species whose rebuilding plans are evaluated in this EIS can be projected based on two key rebuilding parameters: the probability the stock will rebuild in the maximum permissible time period (P_{MAX}) and the target rebuilding year (T_{TARGET}). P_{MAX} can be used to gauge the risk of a particular strategy, while T_{TARGET} indicates how rapidly the stock is projected to return to a size capable of supporting maximum sustainable yield (MSY). The value of both these parameters depends on the fishing mortality rate applied during the rebuilding period. Using these indicators, the No Action Alternative is projected to result in significant impacts because cowcod, widow rockfish, and yelloweye rockfish are not projected to rebuild with at least a 50% probability during the permissible time period. The action alternatives are all projected to result in rebuilding during the time period established for each stock. Stocks would rebuild the slowest under Alternative 1 and fastest under Alternative 4. Alternatives 2 and 3 are intermediate. Under the Council-preferred Alternative the cowcod and widow rockfish P_{MAX} values are 60%, the bocaccio P_{MAX} is 70%, and the yelloweye rockfish P_{MAX} is 80%, using the most recent stock assessments and base models in them where relevant. The Council-preferred Alternative is, therefore, moderately risk averse while rebuilding stocks within the time frame established by National Standard Guidelines.

ES.3.4 Impacts to Co-occurring Species

Overfished species are caught incidentally with other species, which may or may not be the primary target in a given fishery. Overfished species management can, therefore, serve to constrain harvests of co-occurring species. Two management strategies used by the Council directly affect co-occurring species harvests. Cumulative trip limits (the total amount of a given species or species group that may be landed during a two-month period) may be reduced for co-occurring, non-overfished stocks to limit incidental catch of an overfished species. For example, chilipepper rockfish trip limits have been set lower than would be needed to limit harvest to the OY for that species in order to reduce incidental catch of bocaccio. Closed areas are also a key strategy currently used to limit the catch of overfished species. These Groundfish Conservation Areas (GCAs) include the Rockfish Conservation Area (RCA), Cowcod Conservation Area (CCA), and Yelloweye Rockfish Conservation Area (YRCA). Various types of fishing are prohibited in these areas. This may also reduce catches of those co-occurring species which are more abundant in the depth ranges or habitats encompassed by these areas. The No Action Alternative would require lower OYs in the short term, in comparison to 2004 harvest limits, but OYs would rapidly increase. Action Alternatives 1 through 4 require progressively lower harvest limits in order to achieve more rapid rebuilding. As noted, the Council-preferred Alternative incorporates rebuilding strategies from the other action alternatives that are generally intermediate in this range. Lower OYs for the overfished species are likely to result in lower harvests of co-occurring species, if technical measures, such as gear modifications and closed areas, do not reduce the bycatch rates of overfished species. If these measures reduce the bycatch rate, then a larger amount of co-occurring species may be caught for a given amount of overfished species' bycatch.

ES.3.5 Impacts to the Public Sector and Management Regime

Implementing rebuilding plans will affect the management regime by changing the level of regulatory complexity and associated costs. A key component of stock rebuilding is accurate accounting of total fishing mortality on those stocks. This is accomplished through direct monitoring of catches and landings. At-sea observers monitor a portion of the commercial fleet; commercial landings are fully accounted for by dockside monitoring. Recreational catches are more difficult to monitor, but several methods are used, including dockside monitoring and angler surveys. Accurate bycatch accounting becomes more important if total catch projections are close to the annual harvest limit (OY), which can add to public sector costs. Other data gathered during or derived from fishing activities contribute to stock assessments. To the degree that fisheries must be restricted to support stock rebuilding, less of these data are available. Complexity also affects

enforceability. Management measures that influence fishers' behavior at sea, and therefore, must be monitored at sea, are more difficult and costly to enforce. Currently, the GCAs, mentioned above, are the main stock rebuilding related measures requiring at-sea monitoring and enforcement. The CCA and YRCA are fairly discrete and regularly shaped, and their configuration need not be changed in response to different rebuilding targets established under the alternatives. In contrast, the RCA is large—spanning the latitudinal extent of the West Coast EEZ—and has irregular boundaries following depth contours. This complexity is mitigated by a new requirement for all vessels fishing under a groundfish limited entry permit to carry a vessel monitoring system (VMS) transceiver. A VMS allows enforcement personnel to monitor a vessel's location from a shore-based facility. This makes it easier and cheaper to enforce position-dependent management measures such as the GCAs. The Council is now discussing expanding this system to include vessels in the so-called open access sector. (These are vessels that do not possess a groundfish limited entry permit, but target or incidentally catch groundfish.) The No Action Alternative is likely to incur greater public sector costs in the short term because the very low harvest levels needed to meet projected OYs would require complex management measures and more accurate catch accounting. The action alternatives, ranked from Alternative 1 through Alternative 4, would result in increasingly greater public sector costs related to management complexity. Alternative 1 would require measures similar to, or less constraining than, those applied in 2004. Alternative 2 would require more restrictive measures, but the impacts are predicted to be equivalent to those under Alternative 1. Alternatives 3 and 4 would require more complex management measures, primarily in response to reduced harvest levels for widow rockfish and bocaccio. The Council-preferred Alternative adopts rebuilding policies similar to those in place in 2003 and 2004. Implementation of the Council-preferred Alternative is not likely to require substantial change from the kinds of management measures currently in place.

ES.3.6 Impacts to the Socioeconomic Environment

The evaluation of socioeconomic impacts covers several fishery sectors and fishing communities. Impacts by sector are summarized here. Socioeconomic impacts to these sectors are evaluated in terms of the tradeoff between short-term benefits resulting from potentially higher harvests and the time needed to rebuild the stock and associated P_{MAX} . Faster rebuilding will allow fishers to benefit from the higher harvest levels afforded once the stock is rebuilt; but depending on the time needed to reach the target biomass (B_{MSY}), the value of those future harvest may be heavily discounted in the present. The Council-preferred Alternative combines rebuilding strategies included in the other alternatives. The socioeconomic impacts of this alternative is within the range of impacts described below for the action alternatives.

Commercial fisheries will be most affected by measures to rebuild widow rockfish and bocaccio under the most restrictive alternatives. Under all the alternatives, except No Action, there is little practical difference between the alternatives in terms of the targets for cowcod and yelloweye rockfish. The kinds of management measures necessary to constrain total fishing mortality of these species are unlikely to differ substantially from the measures in place in 2004. In the commercial sector, bocaccio rebuilding targets are most likely to affect fixed gear and open access (exempted trawl) vessels, especially south of Cape Mendocino, California. The most restrictive widow rockfish rebuilding targets would affect fixed gear and recreational fishing north of Cape Mendocino, in addition to the midwater trawl fishery for Pacific whiting. Management measures substantially different than those currently in place are only likely under Alternatives 3 and 4.

Buyers and processors will be affected to the degree that their input—landed fish—becomes more or less available due to rebuilding-related harvest restrictions. If fish become less available, it would be more difficult for buyers and processors to cover their fixed costs, and profitability could decline. Stock recovery would presumably have the opposite effect. Widow rockfish rebuilding measures would most affect buyers and processors of Pacific whiting. Yelloweye rockfish rebuilding most affects purchases of line-caught fish. Bocaccio rebuilding affects those purchasing from exempted trawl and fixed gear fisheries south of Cape

Mendocino. As noted above, Alternatives 3 and 4 are likely to require management measures more restrictive than currently in place over the long term. The No Action Alternative is very restrictive in the short term, but projected OYs, and thus anticipated harvest and potential deliveries to buyers and processors, rapidly escalate over the next decade.

Recreational fishers catch all four species whose rebuilding plans are evaluated in this EIS. However, management measures required to meet rebuilding targets under the alternatives are unlikely to differ substantially from what is currently in place because of the need to restrict catch of other, co-occurring overfished species, especially lingcod and canary rockfish. Alternative 4, which has very low projected OYs for widow rockfish is an exception; all West Coast fisheries, including recreational fisheries, would have to be further restricted if this alternative were implemented.

Tribal fisheries are prosecuted by four Indian tribes in Washington State, which have treaty rights to groundfish. They participate in the midwater trawl fishery for Pacific whiting, directed midwater trawl fisheries for yellowtail and widow rockfish, and longline fisheries. Low OYs required under the No Action Alternative in the short-term, and restrictions applying to widow rockfish under Alternative 4, and Alternative 3 to a more modest extent, would likely require reduction in tribal harvests. Yelloweye rockfish are taken in longline fisheries, but measures required under the action alternatives are not likely to differ substantially from those currently in place.

Coastal communities on the West Coast are substantially engaged in or dependent upon groundfish fisheries. The effects on communities are the net sum of impacts on the fishery sectors and buyers and processors described above. To this may be added any changes in employment and income in coastal communities economically linked to these sectors. Communities in Washington, Oregon, and Northern California would be most affected by management restrictions necessary to rebuild the widow and yelloweye rockfish stocks, while Southern California communities would be affected by measures to rebuild bocaccio and cowcod.

Nonconsumers/nonusers benefit from the knowledge that the environment is in a healthy state, even if they are not directly affected by changes in the opportunity to consume, use, or directly enjoy a resource or environmental component. Nonconsumers and nonusers are likely to derive greater benefit if overfished species return to higher population levels more rapidly through more aggressive rebuilding policies.

TABLE ES-1. Summary of the environmental impacts of the alternatives presented in the DEIS. (Page 1 of 3)

	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Marine Ecosystems and Essential Fish Habitat	Short term decrease in impacts. In the long term impacts are indistinguishable between the alternatives.	Short term effects unlikely to differ from No Action due to mitigation such as EFH EIS, closed areas. In the long term impacts are indistinguishable between the alternatives.	Short term effects unlikely to differ from No Action due to mitigation such as EFH EIS, closed areas. In the long term impacts are indistinguishable between the alternatives.	Short term effects unlikely to differ from No Action due to mitigation such as EFH EIS, closed areas. In the long term impacts are indistinguishable between the alternatives.	Lowest level of short term impacts. EFH EIS, closed areas also apply. Slowest increase in impacts. In the long term impacts are indistinguishable between the alternatives.
Protected Species	Possible short term increase in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.	Little or no short term increase in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.	Little or no increase short term in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.	No increase in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.	Possible short term reduction in impacts. In the long term impacts are indistinguishable between the alternatives.
Overfished Species in this EIS	Rebuilding only occurs for one of the four species (bocaccio).	First species rebuilt is bocaccio (2025). Rebuilding occurs for all four species by 2095.	First species rebuilt is bocaccio (2023). Rebuilding occurs for all four species by 2090.	First species rebuilt is bocaccio (2020). Rebuilding occurs for all four species by 2090.	First species rebuilt is bocaccio (2018). Rebuilding occurs for all four species by 2090.
Co-occurring Species	Constraints on shelf fisheries south of Cape Mendocino would reduce short term fishing mortalities for co-occurring species. In the long term impacts are indistinguishable between the alternatives.	Greatest short term impacts on co-occurring species. In the long term impacts are indistinguishable between the alternatives.	Lower mortality in short term of species caught incidentally in whiting than Alternative 1. In the long term impacts are indistinguishable between the alternatives.	Lower mortality in short term of species caught incidentally in whiting trawl than Alternative 2. In the long term impacts are indistinguishable between the alternatives.	Lowest mortality in short term for co-occurring species. In the long term impacts are indistinguishable between the alternatives.
Public Sector and Management Regime	Very conservative and complex management regulations south of Cape Mendocino. Probably high survey costs.	Most liberal management regime. Least complex regulations. Potentially higher enforcement costs.	Similar to Alternative 1, but possibly higher management costs for whiting fishery.	Higher management and enforcement costs than Alternative 2.	Most constrained management regime. Probable closure of northern midwater and southern nearshore fisheries. Impacts to the public sector and the management regime greater than under Alternative 3.

TABLE ES-1. Summary of the environmental impacts of the alternatives presented in the DEIS. (Page 2 of 3)

	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Commercial Vessels	Increased benefits for midwater trawl and whiting trawl fisheries, but not sustainable. Severely limited fisheries south of Cape Mendocino.	Maintains same general level and distribution of activity as in 2004. Allows highest level of activity among the alternatives in northern midwater trawl and whiting trawl fisheries, and in southern exempted trawl and fixed gear fisheries.	Maintains similar level of activity as in 2004. May constrain midwater trawl and whiting trawl more than in 2004.	Maintains similar level of activity as in 2004. Constrains midwater trawl and whiting trawl more than Alternative 2.	Lowest activity level for most commercial fisheries. Fisheries north and south of Cape Mendocino are very constrained. Virtual elimination of midwater trawl and whiting trawl in the short term.
Buyers and Processors	Increased benefits for whiting processors. Severely limited harvests from most fisheries south of Cape Mendocino	Maintains same general level and distribution of harvest as in 2004. Allows increased whiting harvest. May allow increased harvests from exempted trawl and fixed gear fisheries south of Cape Mendocino.	Maintains same general level and distribution of harvest as in 2004. Less favorable for whiting processors than Alternative 1. May allow some increase in exempted trawl and fixed gear harvests south of Cape Mendocino.	Maintains same general level and distribution of harvest as in 2004, but whiting harvest lower than Alternative 2.	Lowest harvests among the alternatives north and south of Cape Mendocino. Virtual elimination of whiting harvests in the short term.
Recreational Fishery	Virtual elimination of recreational groundfish fisheries south of Cape Mendocino.	Maintains at least the same level of activity as in 2004 north of Cape Mendocino. May allow increased activity south of Cape Mendocino.	Maintains the same level of activity as in 2004.	Maintains similar level of recreational fishing activity as in 2004. May constrain fisheries north of Cape Mendocino more than in 2004.	Much lower activity than in 2004 for recreational groundfish fisheries north and south of Cape Mendocino. May also constrain non-groundfish recreational fisheries.
Tribal Fishery	Most beneficial to tribal vessels midwater trawl and whiting trawl vessels.	Maintains at least the same level of tribal fishing activity as in 2004. Allows increased activity for tribal midwater trawl and whiting trawl.	May constrain tribal midwater trawl and whiting trawl fisheries more than in 2004.	Constrains tribal midwater trawl and whiting trawl fisheries more than Alternative 2.	Virtual elimination of the tribal midwater trawl and whiting fishery in the near term.

TABLE ES-1. Summary of the environmental impacts of the alternatives presented in the DEIS. (Page 3 of 3)

	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Communities	Negatively impact fishing communities in southern and central California. May be the most favorable for harvesters and processors north of Cape Mendocino.	Maintains at least the same level of benefits to West Coast communities as in 2004. May allow increased benefits from whiting harvest and processing for communities north of Cape Mendocino. May allow increased benefits from exempted trawl and fixed gear for communities south of Cape Mendocino.	Generally maintains the level of benefits to West Coast communities as in 2004. May reduce benefits below 2004 level from whiting harvest and processing for communities north of Cape Mendocino.	Reduced level of benefits than in 2004, especially for communities north of Cape Mendocino.	Severely depress harvests north and south of Cape Mendocino. Virtual elimination of whiting harvests.
Nonconsumers and Nonusers	Rebuilding occurs only for bocaccio.	Slowest rebuilding. Lowest value to nonconsumers and non-users.	Second slowest rebuilding. Second lowest value to nonconsumers and non-users.	Second fastest rebuilding for all species. Second highest value to nonconsumers and non-users.	Fastest rebuilding for all species. Highest value to nonconsumers and non-users.

TABLE ES-2. Summary of the environmental impacts of the Council-preferred Alternative on the four overfished species addressed in this EIS. (Page 1 of 2)

	Bocaccio (Alt 2)	Cowcod (Alt 2, 3 and 4)	Widow Rockfish (Alt 1)	Yelloweye Rockfish (Alt 3)
Marine Ecosystems and Essential Fish Habitat	Short term effects unlikely to differ from status quo due to mitigation such as EFH EIS, closed areas. In the long term impacts are indistinguishable between the alternatives.	Short term effects unlikely to differ from status quo due to mitigation such as EFH EIS, closed areas. In the long term impacts are indistinguishable between the alternatives.	Short term effects unlikely to differ from status quo due to mitigation such as EFH EIS, closed areas. In the long term impacts are indistinguishable between the alternatives.	Short term effects unlikely to differ from status quo due to mitigation such as EFH EIS, closed areas. In the long term impacts are indistinguishable between the alternatives.
Protected Species	Little or no increase in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.	No increase in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.	Little or no increase in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.	No increase in impacts on marine mammals and seabirds. In the long term impacts are indistinguishable between the alternatives.
Overfished Species in this EIS	Ttarget for bocaccio is 2023 (2nd slowest rebuilding alternative).	Ttarget for cowcod is 2090 (fastest rebuilding alternative).	Ttarget for widow rockfish is 2038 (slowest rebuilding alternative).	Ttarget for yelloweye rockfish is 2058 (2nd fastest rebuilding alternative).
Co-occurring Species	Status quo short term impacts on nearshore and shelf species south of Cape Mendicino. In the long term impacts are indistinguishable between the alternatives.	Short term and long term impacts are indistinguishable between the alternatives for cowcod.	Greatest short term impacts on species caught in whiting and midwater trawls. In the long term impacts are indistinguishable between the alternatives.	Short term and long term impacts are indistinguishable between the alternatives for yelloweye.
Public Sector and Management Regime	Similar costs for bocaccio management measures as in 2004.	Similar costs for cowcod management measures as in 2004.	Most liberal management regime for whiting and midwater trawl. Potentially higher enforcement costs.	Similar management and enforcement costs for yelloweye as in 2004.
Commercial Vessels	Maintains similar level of fishing activity as in 2004.	Maintains similar level of fishing activity as in 2004. Continues exclusion from Cowcod Conservation Area.	Allows highest level of fishing activity among the alternatives in northern midwater trawl and whiting trawl fisheries.	Maintains similar level of fishing activity as in 2004.
Buyers and Processors	Maintains same general level and distribution of harvest as in 2004.	Maintains same general level and distribution of harvest as in 2004.	Allows increased whiting harvest compared with 2004.	Maintains same general level and distribution of harvest as in 2004.
Recreational Fishery	Allows the same level of activity as in 2004.	Allows the same level of activity as in 2004.	Allows the same level of activity as in 2004.	Allows the same level of activity as in 2004.
Tribal Fishery	No effect on Tribal groundfish fisheries.	No effect on Tribal groundfish fisheries.	Allows increased fishing for tribal midwater trawl and whiting trawl.	Allows the same level of activity as in 2004.

TABLE ES-2. Summary of the environmental impacts of the Council-preferred Alternative on the four overfished species addressed in this EIS. (Page 2 of 2)

	Bocaccio (Alt 2)	Cowcod (Alt 2, 3 and 4)	Widow Rockfish (Alt 1)	Yelloweye Rockfish (Alt 3)
Communities	Maintains at least the same level of benefits to West Coast communities as in 2004.	Maintains at least the same level of benefits to West Coast communities as in 2004.	May increase benefits from whiting harvest and processing for communities north of Cape Mendocino.	Maintains at least the same level of benefits to West Coast communities as in 2004.
Nonconsumers and Nonusers	Second slowest rebuilding for bocaccio. Second lowest value to nonconsumers and non-users.	Second fastest rebuilding for cowcod. However little difference in value to nonconsumers and non-users between the alternatives.	Slowest rebuilding for widow. Lowest value to nonconsumers and non-users.	Second fastest rebuilding for yelloweye. Second highest value to nonconsumers and non-users.

