

MANAGEMENT MEASURES FOR SPINY DOGFISH
AND PACIFIC COD FOR 2006

The Groundfish Management Team (GMT) has recently raised concerns regarding the management of two West Coast groundfish species managed under the Groundfish Fishery Management Plan-spiny dogfish and Pacific cod. The GMT believes current harvest controls are inadequate to effectively manage these species and recommended Council consideration of management measures for 2006 fisheries at the last Council meeting (Agenda Item H.9.a, Attachment 1).

The Council adopted the GMT-recommended alternative management measures for analysis and public review at their September meeting. Washington Department of Fish and Wildlife staff began preparation of a preliminary draft Environmental Assessment (EA) (Agenda Item H.9.a, Attachment 2), which will analyze the effects of alternative management measures to control the future harvest of spiny dogfish and Pacific cod. This draft EA will be tiered off the Final Environmental Impact Statement developed to decide the 2005-2006 groundfish harvest specifications and management measures. The Council should use this preliminary draft EA and any other supplemental information to decide a preferred alternative for managing these species in 2006. New regulations for managing spiny dogfish and Pacific cod are expected to be implemented by March 1, 2006.

Council Action:

Adopt Final Recommendations for 2006 Management Measures for Spiny Dogfish and Pacific Cod.

Reference Materials:

1. Agenda Item H.9.a, Attachment 1: September 2005 Groundfish Management Team Report on Management Specifications for Spiny Dogfish and Pacific Cod For 2006.
2. Agenda Item H.9.a, Attachment 2: Preliminary Draft Environmental Assessment and Regulatory Impact Review of Management Measures for Spiny Dogfish (*Squalus acanthias*) and Pacific Cod (*Gadus macrocephalus*).

Agenda Order:

- a. Agenda Item Overview
- b. Reports and Comments of Advisory Bodies
- c. Public Comment
- d. **Council Action:** Adopt Final Recommendations for 2006 Management Measures

John DeVore

PFMC
10/17/05

GROUND FISH MANAGEMENT TEAM REPORT ON MANAGEMENT SPECIFICATIONS FOR SPINY DOGFISH AND PACIFIC COD FOR 2006

At the June Council meeting, based on recommendations from the Groundfish Management Team (GMT), the Council decided to include on its September agenda, consideration of setting an acceptable biological catch (ABC) and optimum yield (OY) for spiny dogfish, and management measures (i.e., trip limits) for both Pacific cod (which already has an OY) and dogfish. After further discussion, the GMT recommends that the setting of an ABC and OY for spiny dogfish be considered through the 2009-10 specifications process, following the completion and approval of a stock assessment in 2007, and that the Council only consider management measures for these two species for 2006 (and 2007-2008). The GMT notes that other species, such as California scorpionfish, have had trip limits in place prior to a formal assessment and the setting of an ABC and OY. Therefore, the GMT developed alternatives for management measures for Pacific cod and spiny dogfish for the Council's consideration, which would be effective in 2006. The GMT would like to stress that, once adopted, changes to the trip limit amounts may be considered for 2007-2008, as well as through inseason adjustments.

Process and Timeline

It is our understanding that given the timing of the federal rule-making process, it is unlikely that measures would be in place for the January 1, 2006, start date of the fishing year. Therefore, the alternatives developed by the GMT all have an implementation date of March 1, 2006, which is the beginning of the second two-month cumulative period. The National Marine Fisheries Service and the Washington Department of Fish and Wildlife are preparing a draft Environmental Assessment (EA), which is tiered from the 2005-2006 specifications Environmental Impact Statement (EIS). The EA will include environmental and economic analyses of the alternatives selected by the Council for consideration.

Intersector Allocations

Because there is not a separate ABC and OY for spiny dogfish, and given that this species is targeted by all commercial sectors—limited entry and open access, and both trawl and fixed gear—the GMT is not proposing differential trip limits by sector. Rather, the trip limits across Alternatives 2 and 3 are the same for all commercial sectors in all periods.

While there is an OY for Pacific cod, the recent and historical landings are almost all trawl. A review of the 2000-2004 data indicates that a minimal trip limit (~ 1,000 lbs/2 months) would accommodate all of the limited entry and open access fixed gear landings; therefore, the trip limits for these sectors remain static across Alternatives 2 and 3. The GMT would like to note that these trip limits were developed to accommodate existing fisheries and are not intended to represent any long-term allocation among sectors.

Range of Alternatives

In general, the GMT's approach in developing the range of alternatives was to review the amount of fish needed to accommodate current harvest levels on a two-month cumulative basis. We did not structure alternatives to provide for higher harvest levels for future developing fisheries, as these proposals are for the 2006 fishing year only. If, in the future, there are markets and/or gears developed to allow new, targeted fisheries, then the Council could consider liberalizing trip limits for different sectors, as appropriate.

In order to analyze a full range of alternatives, the GMT is using Alternative 1 (status quo), which is unlimited amounts of Pacific cod and dogfish, to represent the high end of the range.

The GMT did trip frequency analyses for both Pacific cod and dogfish using fish ticket data from the 2000-2004 fisheries. Alternative 2 in each case represents trip limits which would accommodate practically all of the commercial fishing activity that occurred during this timeframe. It is anticipated that, if participation in the directed Pacific cod fishery remains at the current level, these trip limits would result in approaching, but not exceeding, the Pacific cod OY. Given that spiny dogfish would remain under the "Other Fish" category and would not have a separate OY, it is anticipated that the trip limits under Alternative 2 would not result in exceeding the "Other Fish" OY. The GMT notes that the data reviewed include periods when the West Coast groundfish fisheries were not subject to rockfish conservation areas (RCAs); therefore, the resulting harvest levels in 2006 (with RCAs in place) may be lower due to the inaccessibility of these species by one or more gear groups.

Alternative 3, in each case, represents the more conservative end of the range and could be constraining on one or more fisheries. These alternatives would be the most likely to ensure that the Pacific cod and "Other Fish" OYs would not be exceeded inseason; however, these alternatives would not maximize utilization of these species. The GMT's recommended alternatives are:

Spiny Dogfish

Table 1. Limited Entry Trawl; Limited Entry Fixed Gear; Open Access

	Alt 1 (status quo)	Alt 2	Alt 3
Period 1	Status quo – unlimited (rule effective March 1, 2006)		
Period 2	Unlimited	150,000 lbs/2 mo	150,000 lbs/2 mo
Period 3	Unlimited	150,000 lbs/2 mo	150,000 lbs/2 mo
Period 4	Unlimited	100,000 lbs/2 mo	80,000 lbs/2 mo
Period 5	Unlimited	100,000 lbs/2 mo	80,000 lbs/2 mo
Period 6	Unlimited	100,000 lbs/2 mo	80,000 lbs/2 mo

Pacific Cod

Table 2. Limited Entry Trawl

	Alt 1 (status quo)	Alt 2	Alt 3
Period 1	Status quo – unlimited (rule effective March 1, 2006)		
Period 2	Unlimited	30,000 lbs/2 mo	30,000 lbs/2 mo
Period 3	Unlimited	70,000 lbs/2 mo	70,000 lbs/2 mo
Period 4	Unlimited	70,000 lbs/2 mo	70,000 lbs/2 mo
Period 5	Unlimited	70,000 lbs/2 mo	45,000 lbs/2 mo
Period 6	Unlimited	30,000 lbs/2 mo	30,000 lbs/2 mo

Table 3. Limited Entry Fixed Gear and Open Access

	Alt 1 (status quo)	Alt 2	Alt 3
Period 1	Status quo – unlimited (rule effective March 1, 2006)		
Period 2	Unlimited	1,000 lbs/2 mo	1,000 lbs/2 mo
Period 3	Unlimited	1,000 lbs/2 mo	1,000 lbs/2 mo
Period 4	Unlimited	1,000 lbs/2 mo	1,000 lbs/2 mo
Period 5	Unlimited	1,000 lbs/2 mo	1,000 lbs/2 mo
Period 6	Unlimited	1,000 lbs/2 mo	1,000 lbs/2 mo

Analysis of Alternatives

As noted in the Situation Summary, setting management measures for spiny dogfish and Pacific cod proactively addresses unanticipated participants in the open access fisheries, and the estimated amounts of targeted species harvest and potential bycatch of overfished rockfish. This concern is currently addressed through bycatch caps on canary and yelloweye rockfish that were established for the open access sector through emergency rule. If the Council ultimately decides to implement trip limits for spiny dogfish and Pacific cod for 2006, then the GMT would recommend that the bycatch caps for canary and yelloweye for the open access sector not be extended into 2006.

GMT Recommendations

1. Approve the management measure alternatives listed for spiny dogfish and Pacific cod for public review, with final adoption scheduled for the November Council meeting.
2. Defer the consideration of setting specifications (ABC and OY) for spiny dogfish until the 2009-2010 management cycle, following approval of a formal assessment in 2007.

PFMC
09/20/05

PRELIMINARY DRAFT

ENVIRONMENTAL ASSESSMENT

AND

REGULATORY IMPACT REVIEW

OF

MANAGEMENT MEASURES
FOR SPINY DOGFISH (*Squalus acanthias*)
AND PACIFIC COD (*Gadus macrocephalus*)

[**NOTE:** A draft of this EA that includes alternatives for Pacific cod and a socioeconomic analysis for both spiny dogfish and Pacific cod will be available at the November 2005 Council meeting. That draft EA will replace this preliminary draft EA.]

October 2005

Prepared by
Washington Department of Fish and Wildlife and
National Marine Fisheries Service

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1.0 INTRODUCTION

1.1 How This Document is Organized

This document provides background information about, and analysis of, management measures for the spiny dogfish (*Squalus acanthias*) and Pacific cod (*Gadus macrocephalus*) fisheries covered by the Pacific Coast Groundfish Fishery Management Plan (FMP) and developed by the Pacific Fishery Management Council (Council) in collaboration with the National Marine Fisheries Service (NMFS). These measures 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 tiers from the environmental impact statement prepared for the 2005-2006 groundfish harvest specifications and management measures titled, "Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery, Final Environmental Impact Statement including Regulatory Impact Review and Initial Regulatory Flexibility Analysis" (Council, October 2004) (hereafter, 2005-2006 Specs EIS). Federal regulations (40 CFR 1508.28) state "Tiering is appropriate when the sequence of statements or analyses is: (a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis...." In this case, the tiered EA focuses on spiny dogfish and Pacific cod management measures for 2006 where the EIS covered harvest specifications and management measures for the entire Pacific Coast groundfish fishery during 2005-2006.

This document is organized so that it not only contains the analyses required under NEPA, but also the Regulatory Flexibility Act (RFA), and Executive Order (EO) 12866, which mandates an analysis similar to the RFA. For the sake of brevity, this document is referred to as an EA, although it contains required elements of an Initial Regulatory Flexibility Analysis (IRFA) pursuant to the RFA and a Regulatory Impact Review (RIR) pursuant to EO 12866.

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. (The human environment is interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment, 40 CFR 1508.14.) These elements allow the decision maker to look at different approaches to accomplishing a stated goal and understand the likely consequences of each choice or alternative. This EA is organized with Chapters 1 and 2 covering the purpose and need and describing 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.

Based on this structure, the document is organized in the following chapters:

- The rest of this chapter, Chapter 1, discusses the reasons for new federal management measures for spiny dogfish and Pacific cod fisheries beginning in 2006. This description of **purpose and need** defines the scope of the subsequent analysis.
- Chapter 2 outlines different **alternatives** that have been considered to address the purpose and need.
- Chapter 3 describes **West Coast marine ecosystems and essential fish habitat (EFH)** potentially affected by the proposed action and discloses the predicted impacts of the alternatives on that segment of the physical and biological environment. Chapter 3 also describes the **public sector and fisheries management regime** and how the different alternatives would affect these institutions.
- Chapter 4 describes the **groundfish fishery management unit species; other, non-groundfish species; and protected species** potentially affected by the proposed action and discloses the predicted impacts of the alternatives on that segment of the biological environment. Chapter 4 also describes the **socioeconomic environment**, which includes commercial, tribal, and recreational fisheries in the action area and how they would be affected by the different alternatives.
- Chapter 5 provides information on those laws and EOs, in addition to the MSA and NEPA, that an action must be consistent with, and how this action has satisfied those mandates.
- Chapter 6 addresses the Regulatory Flexibility Act and EO 12866 (Regulatory Impact Review).
- Chapter 7 describes the list of preparers and the bibliography.

1.2 Purpose and Need for the Proposed Action

The proposed action falls within the management framework described in the Groundfish FMP, which enumerates objectives that management measures must satisfy (organized under three broad goals) and authorizes the range and type of measures that may be used to achieve optimum yield (OY). The management regime described in the Groundfish FMP is itself consistent with 10 National Standards described in the MSA. Management measures must be consistent with the goals, objectives, and management framework described in the Groundfish FMP.

1.2.1 The Proposed Action

The *proposed action*, evaluated in this document, is to establish management measures to constrain total fishing mortality to within harvest specifications for spiny dogfish and Pacific cod, and co-occurring species. These management measures will be established for the calendar year 2006, although they are considered within the context of past management and long-term sustainability of managed fish stocks. Separate harvest specifications (acceptable biological catch (ABC)/OY) are established for each year, 2005 and 2006; management measures like those considered in this EA are intended to keep total fishing mortality during each year within the ABC/OY established for that year. Federally managed Pacific groundfish fisheries occurring off the coasts of Washington, Oregon, and California (WOC) establish the geographic context for the proposed action.

1.2.2 Need (Problems for Resolution)

The *proposed action is needed* to constrain commercial harvests in 2006 to levels that will ensure the spiny dogfish and Pacific cod stocks, and co-occurring species, are maintained at, or restored to, sizes and structures that will produce the highest net benefit to the nation, while balancing environmental and social values.

1.2.3 Purpose of the Proposed Action

The *purpose of this action* is to ensure spiny dogfish and Pacific cod are harvested within ABC/OY limits during 2006 and in a manner consistent with the aforementioned Groundfish FMP and National Standards Guidelines (NSGs) (50 CFR 600 Subpart D), using routine management tools available to the specifications and management measures process (FMP at 6.2.1, 50 CFR 660.370(c)). Chapter 10 of this EA describes how the proposed action (preferred alternative) is consistent with the FMP and MSA.

1.3 Background to Purpose and Need

For a background to overall groundfish management and the specifications process, refer to Chapter 1.3 of the 2005-2006 Specs EIS. A background to the purpose and need for spiny dogfish and Pacific cod follows.

Spiny dogfish and Pacific cod are considered “groundfish” and are managed under the Pacific Coast groundfish FMP. Recent harvest levels and the potential for new markets developing off the West Coast has highlighted the potential need for further management measures, such as trip limits, to control harvest of these species in 2006.

Both of these stocks have harvest specifications (also known as ABC/OY) set for 2005 and 2006. Pacific cod has its own ABC/OY and spiny dogfish is included in the “other fish” ABC/OY. Under the groundfish FMP, Pacific cod and “other fish” is considered a Category 2 stocks, where the ABC is based on a nonquantitative assessment, average of past landings, or other qualitative information and a numerical OY, with a precautionary adjustment, is determined from the ABC.

The ABC levels for Pacific cod and “other fish” have been based on historical landings. When determining numerical OYs for individual species and species groups for which the ABC is based on a non-quantitative assessment, the Council may apply precautionary adjustments. Since 2000, the Council has adjusted the OYs for several unassessed stocks to 50 percent of the historical average catch levels. Although the ABCs for Pacific cod and “other fish” have been based on historical landings, precautionary adjustments were not used to establish OYs until the 2005-2006 biennial management cycle.

For 2005 and 2006, the OYs for Pacific cod and “other fish” were reduced based on a 50 percent precautionary adjustment. The OY for Pacific cod in both 2005 and 2006 is 1,600 mt, which represents the ABC (3,200 mt) with a 50 percent precautionary adjustment. In most years since the mid-1990s, less than 500 mt of Pacific cod have been landed. Recent harvest levels for the Canadian fishery have been set as low as 240 mt to allow for the stock to rebuild and have been

combined with closed areas during the spawning season. During the 2005-2006 biennial groundfish specifications and management measures process, the Council considered recent harvest levels as well as harvest specifications established for what is believed to be the same Pacific cod stock in Canadian waters and recommended that an OY of 1,600 mt be adopted for Pacific cod. An OY of 1,600 mt was estimated to be adequate to accommodate recent landings, while not being so high as to encourage targeting. The OY for “other fish,” including spiny dogfish, in both 2005 and 2006 is 7,300 mt, which represents the ABC (14,600 mt) with a 50 percent precautionary adjustment. The Council considered the recent landings, which ranged between approximately 2,500 mt in 1999 and 1,300 mt in 2002, prior to recommending that an OY of 7,300 mt be adopted for “other fish.”

Neither Pacific cod nor spiny dogfish have ever been formally assessed on the West Coast. A formal stock assessment for West Coast spiny dogfish is recommended for the next assessment cycle (2007). Even in the absence of a formal assessment, life history information indicates that characteristics of the spiny dogfish (slow growing, late maturing, low fecundity) make it susceptible to overfishing. Dogfish populations have been depressed as a result of fishing in areas of Puget Sound and have been declared overfished off the East Coast. Pacific cod, on the other hand, is a transboundary stock with most of its biomass distributed north of the U.S.-Canada border. Pacific cod stocks are depressed off the West Coast of Canada.

Spiny dogfish is an important species to West Coast groundfish fisheries, primarily off the Washington coast, and fishermen and processors have worked aggressively to develop and maintain strong markets for this species. A number of trawl and longline fishers and at least one major processor are heavily dependent upon spiny dogfish. Pacific cod is harvested primarily in the limited entry trawl fleet north of 40°10' N. latitude.

In recent years, commercial fishermen targeting spiny dogfish have been constrained by their assumed bycatch of yelloweye and canary rockfish, two species considered by the Council to be overfished, and are managed under rebuilding plans. To provide protection for these overfished stocks, NMFS implemented rockfish conservation areas (RCAs), which are large areas closed to fishing with designated gear types. The boundaries of the RCAs change, depending upon the fishing period. The trawl RCA generally encompasses the area between 100 fms and 200 fms north of 40°10' N. latitude. The non-trawl RCA, which pertains to other gears, such as longline and pot fisheries, extends from the shore seaward to 100 fms year-round north of 40°10' N. latitude. The spiny dogfish fishery occurs around the 100-fathom isobath, and dogfish are targeted by both trawl and non-trawl gears. While there are limited entry programs in place for trawl and fixed gear, there is also an open access fishery, which is allowed to target groundfish with fixed gear.

Since effort is not limited, there is a potential to overharvest spiny dogfish and Pacific cod and/or exceed the projected bycatch associated with the fisheries inseason, even with the RCAs in place. To address the potential of exceeding the estimated amounts of canary and yelloweye rockfish bycatch, which was anticipated for the open access fishery in 2005, the NMFS adopted an emergency rule to set bycatch limits for the directed groundfish open access fishery. These limits were originally set at 1.0 mt for canary rockfish and 0.6 mt for yelloweye rockfish; these limits were raised inseason to 3.0 mt of each species, based on updated projections using NMFS West Coast Groundfish Observer Program data.

Given the life history characteristics of spiny dogfish and their status in other areas, the Council's Groundfish Management Team (GMT) recommended that the Council consider adopting harvest control regulations (i.e., trip limits), beginning in 2006. Given that a spiny dogfish assessment is likely to occur in 2007, the Council decided to set a separate ABC and OY for spiny dogfish following the next assessment cycle (i.e., for the 2009-2010 management period).

Neither stock has had management measures, such as trip limits, specified in the past. This is a potential management concern given the conservation issues of these stocks and, for Pacific cod, 2004 harvests that approached the 2005 OY off the West Coast.

1.4 Public Participation

Spiny dogfish and Pacific cod management are administered through the Pacific Fishery Management Council. At their June 2005 meeting, the Council requested that trip limits for spiny dogfish and Pacific cod be developed for initial consideration at their September 2005 meeting. The Council's Groundfish Management Team developed and analyzed trip limit alternatives for spiny dogfish and Pacific cod at their August and September 2005 meetings; these alternatives were discussed with the Council's Groundfish Advisory Subpanel and the public at the Council's September 2005 meeting. The Council and public will review these alternatives again at the November 2005 meeting, when the Council will consider final action on the alternatives.

Following the November Council meeting, the public will have an additional opportunity to review and comment on the alternatives when NMFS publishes the preferred alternative for review in the Federal Register.

Specification alternatives, including for Pacific cod and the "Other Fish" category, and proposals related to protection for overfished groundfish stocks underwent scoping through the Council's annual management process for groundfish, which began at the November 2003 Council meeting and continued with subsequent Council, Allocation Committee, Groundfish Management Team meetings and state-sponsored meetings through to the Council's June 2004 meeting. At its June 2004 meeting, the Council made final recommendations for 2005 and 2006 groundfish management and recommendations for management of fisheries targeting non-groundfish species that have the potential to incidentally harvest overfished groundfish species. A full description of the Council's scoping process, alternatives considered, and analyses of those alternatives is provided in the 2005-2006 Specs EIS.

1.5 Related National Environmental Policy Act (NEPA) Documents

Final EIS for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery, October 2004 (2005-2006 Specs EIS). This EIS for the 2005-06 specifications and management measures discusses the full suite of optimum yield specifications and regulatory measures proposed to protect overfished groundfish species from directed and incidental harvest.

2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Establish Trip Limits for Spiny Dogfish

At the June 2005 Council meeting, based on recommendations from the Groundfish Management Team (GMT), the Council decided to include on its September 2005 agenda, consideration of setting management measures for spiny dogfish, which would be effective in 2006. Once adopted, changes to the trip limit amounts may be considered for 2007-08, as well as through inseason adjustments.

Given the timing of the federal rule-making process, it is unlikely that measures would be in place for the January 1, 2006, start date of the fishing year. Therefore, the alternatives considered by the Council all have an implementation date of March 1, 2006, which is the beginning of the second two-month cumulative period.

Because there is not a separate ABC and OY for spiny dogfish, and given that this species is targeted by all commercial sectors—limited entry and open access, and both trawl and fixed gear—the Council is not proposing differential trip limits by sector. Rather, the trip limits across Alternatives 2 and 3 are the same for all commercial sectors in all periods.

In general, the Council’s approach in developing the range of alternatives was to review the amount of fish needed to accommodate current harvest levels on a two-month cumulative basis. Alternatives were not structured to provide for higher harvest levels for future developing fisheries, as these proposals are for the 2006 fishing year only. If, in the future, there are markets and/or gears developed to allow new, targeted fisheries, then the Council could consider liberalizing trip limits for different sectors, as appropriate.

In order to analyze a full range of alternatives, the Council is using Alternative 1 (status quo), which is unlimited amounts of spiny dogfish, to represent the high end of the range.

The GMT did trip frequency analyses for dogfish using fish ticket data from the 2000-2004 fisheries. Alternative 2 represents trip limits which would accommodate practically all of the commercial fishing activity that occurred during this timeframe. Given that spiny dogfish would remain under the “Other Fish” category and would not have a separate OY, it is anticipated that the trip limits under Alternative 2 would not result in nearly achieving, but not exceeding, the “Other Fish” OY. The GMT notes that the data reviewed include periods when the West Coast groundfish fisheries were not subject to RCAs; therefore, the resulting harvest levels in 2006 (with RCAs in place) may be lower due to the inaccessibility of these species by one or more gear groups.

Alternative 3 represents the more conservative end of the range and could be constraining on one or more fisheries. These alternatives would be the most likely to ensure that the “Other Fish” OY would not be exceeded inseason; however, this alternative would not maximize utilization of this species. The GMT’s recommended alternatives are:

Table 2.1.1 Spiny dogfish trip limit alternatives for the limited entry trawl, limited entry fixed gear, and open access fisheries coastwide.

	Alt 1 (status quo)	Alt 2	Alt 3
Period 1	Status quo – unlimited (rule effective March 1, 2006)		
Period 2	Unlimited	150,000 lbs/2 mo	150,000 lbs/2 mo
Period 3	Unlimited	150,000 lbs/2 mo	150,000 lbs/2 mo
Period 4	Unlimited	100,000 lbs/2 mo	80,000 lbs/2 mo
Period 5	Unlimited	100,000 lbs/2 mo	80,000 lbs/2 mo
Period 6	Unlimited	100,000 lbs/2 mo	80,000 lbs/2 mo

3.0 AFFECTED ENVIRONMENT

3.1 Physical Environment

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

Topography. Physical topography off the U.S. West Coast is characterized by a relatively narrow continental shelf. The 200 m depth contour shows a shelf break closest to the shoreline off Cape Mendocino, Point Sur, and in the Southern California Bight and widest from central Oregon north to the Canadian border as well as off Monterey Bay. Deep submarine canyons pocket the EEZ, with depths greater than 4,000 m common south of Cape Mendocino. See Figure 3.3.

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

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

Most of the scientific analysis on long-scale climate shift events has taken place within the past ten years. Recent public awareness of climate events like PDO, coupled with the relatively dramatic El Niño of 1997-1998 may create the perception that climate is the most significant contributor to marine species abundance. In an analysis of marine fish productivity in the Northeast Pacific Ocean, Hollowed, Hare, and Wooster found that links between marine fish recruitment and climate shifts were more clear for conservatively managed species (Hollowed, et al., 2001).

Habitat. Spiny dogfish habitat off the West Coast has been categorized in the Pacific Coast Groundfish Fishery Management Plan (FMP) into seven major habitat types. These habitat categories include all waters from the mean higher high water line, and the upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon, and California seaward to the boundary of the U.S. EEZ. This approach focuses on ecological relationships among species and between the species and their habitat, reflecting an ecosystem approach in defining habitat. The seven habitat categories are as follows:

1. Estuarine - Those waters, substrates and associated biological communities within bays and estuaries of the EEZ, from mean higher high water level (MHHW, which is the high tide line) or

extent of upriver saltwater intrusion to the respective outer boundaries for each bay or estuary as defined in 33 CFR 80.1 (Coast Guard lines of demarcation).

2. Rocky Shelf - Those waters, substrates, and associated biological communities living on or within ten meters (5.5 fathoms) overlying rocky areas, including reefs, pinnacles, boulders and cobble, along the continental shelf, excluding canyons, from the high tide line MHHW to the shelf break (~200 meters or 109 fathoms).
3. Non-rocky Shelf - Those waters, substrates, and associated biological communities living on or within ten meters (5.5 fathoms) overlying the substrates of the continental shelf, excluding the rocky shelf and canyon composites, from the high tide line MHHW to the shelf break (~200 meters or 109 fathoms).
4. Canyon - Those waters, substrates, and associated biological communities living within submarine canyons, including the walls, beds, seafloor, and any outcrops or landslide morphology, such as slump scarps and debris fields.
5. Continental Slope/Basin - Those waters, substrates, and biological communities living on or within 20 meters (11 fathoms) overlying the substrates of the continental slope and basin below the shelf break (~200 meters or 109 fathoms) and extending to the westward boundary of the EEZ.
6. Neritic Zone - Those waters and biological communities living in the water column more than ten meters (5.5 fathoms) above the continental shelf.
7. Oceanic Zone - Those waters and biological communities living in the water column more than 20 meters (11 fathoms) above the continental slope and abyssal plain, extending to the westward boundary of the EEZ.

3.2 Biological Environment

This section describes the species that may be directly or indirectly affected by the alternatives. They are divided into three groups. Section 3.2.1 describes spiny dogfish, the species directly subject to the alternatives evaluated in this EA. Section 3.2.2 reviews species that may be incidentally affected, because they are caught incidentally in dogfish fisheries. Section 3.2.3 describes various legally protected species covered by the Endangered Species Act, Marine Mammal Protection Act, and the Migratory Bird Treaty Act.

3.2.1 Spiny Dogfish

Spiny dogfish (*Squalus acanthias*) occur in temperate and subarctic latitudes in both the northern and southern hemispheres, ranging from the Bering Sea to Baja California (Allen & Smith 1988, Castro 1983, Eschmeyer et al. 1983). Dogfish tend to migrate in large schools, and can travel long distances, feeding avidly on their journeys (Bannister 1989). The schools, numbering in the hundreds, exhibit north-south coastal movements and onshore-offshore movements that are not completely understood (Castro 1983, Ferguson & Cailliet 1990, Lineaweaver & Backus 1984). The schools tend to divide up according to size and sex, although the young, both male and

female, tend to stay together (Ferguson & Cailliet 1990, NOAA 1990). They also make diel migrations from near bottom during the day to near surface at night (NOAA 1990).

For the North Pacific and Bering Sea, Allen and Smith (1988) report that the spiny dogfish is an inner shelf-mesobenthic species with a depth range up to 900 m. From survey data, they determined that most dogfish inhabit waters 350 m. They occur from the surface and intertidal areas to greater depths (Allen & Smith 1988, Bannister 1989, Castro 1983, Lineaweaver & Backus 1984, NOAA 1990), and are common in estuaries, such as Puget Sound (Allen & Smith 1988) and San Francisco Bay (Ebert 1986), and in shallow bays from Alaska to central California (Eschmeyer et al. 1983). Small juveniles (< 10 years old) are neritic while subadults and adults are mostly sublittoral-bathyal. Subadults are found on muddy bottoms when not found in the water column. Known physical and chemical requirements are euhaline waters of 3.7-15.6 °C, with a preferred range of 6-11 °C (NOAA 1990).

Spiny dogfish are ovoviviparous, and fecundity is 1-26 eggs per female, per season (Castro 1983, Eschmeyer et al. 1983, Jones & Geen 1977a, NOAA 1990). Males mate annually after reaching sexual maturity at 11-19 years. Females reach sexual maturity at 23-35 years and mate biannually (Jones & Geen 1977a, NOAA 1990). Their gestation period last 18-24 months (usually 23 months), the longest of any vertebrate (Bannister 1989, Jones & Geen 1977a, Nammack et al. 1985, NOAA 1990, Pratt & Casey 1990). Females release their young during the spring in shallow waters (Jones & Geen 1977b, NOAA 1990). Small litters (4-7 pups) are common, but litter size may range from 2-20 pups. Newborn pups range in length from 20-23 cm (Castro 1983, Jones & Geen 1977a, Ketchen 1972, Lineaweaver & Backus 1984, NOAA 1990). Females live longer than males; the maximum age of females is about 70 years, compared with a maximum of 36 years for males (Bannister 1989, Castro 1983, Eschmeyer et al. 1983, Ferguson & Cailliet 1990, Jones & Geen 1977a, Ketchen 1972, Lineaweaver & Backus 1984, McFarlane & Beamish 1986, NOAA 1990). Spiny dogfish seem to be larger at the northern end of their range. Adults usually range in size from 75-103 cm, although they may reach a maximum size of 130 cm (10 kg) (Allen & Smith 1988, Bannister 1989, NOAA 1990). Their growth rate is 1.5-3.5 cm per year (Castro 1983, Ebert 1986). For defense purposes, spiny dogfish possess a strong spine in front of its two dorsal fins that is partially sheathed by toxic tissue (Castro 1983, Jones & Geen 1977a, NOAA 1990).

Spiny dogfish are carnivorous, opportunistic feeders (NOAA 1990). They are voracious predators that can be quite aggressive in pursuit of prey (Castro 1983, Eschmeyer et al. 1983, Ferguson & Cailliet 1990, Jones & Geen 1977b). They are important predators on many commercial fishes and invertebrates (NOAA 1990). Their diet consists primarily of fish and crustaceans, especially sand lance, herrings, smelts, cods, capelin, hake, ratfish, shrimps, and crabs. Fish become a more important dietary source as they grow larger (Castro 1983, Ferguson & Cailliet 1990, Jones & Geen 1977b, NOAA 1990). Other food items include worms, krill, squid, octopus, jellyfish, algae, and any carrion (Bannister 1989). Although most of their diet consists of pelagic prey, they also feed on benthic organisms (NOAA 1990). Based on occurrences, 55% of the diet of dogfish off British Columbia was teleosts, 35% crustaceans and 5% mollusks. The principal food items consisted of herring and euphausiids (Jones & Geen 1977b). Pelagic prey consisted of 80% of their diet and they consumed twice as much food in the summer as in the winter (Jones & Geen 1977b, NOAA 1990). They have few natural predators, except blue and tiger sharks and some marine mammals (Castro 1983, Jones & Geen

1977a, NOAA 1990).

3.2.2 Other Affected Species

Pacific Halibut

The targeted dogfish fishery occasionally intercepts Pacific halibut, a prohibited species, because they are easily caught with trawl and longline gears. Pacific halibut (*Hippoglossus stenolepis*) range from the Hokkaido, Japan to the Gulf of Anadyr, Russia on the Asiatic Coast and from Nome, Alaska to Santa Barbara, California on the North American (Pacific) Coast. They are among the largest teleost fishes in the world, measuring up to 8 ft (2.4 m). With flat, diamond-shaped bodies, Pacific halibut are able to migrate long distances. However, most adults tend to remain on the same grounds year after year, making only a seasonal migration from the more shallow feeding grounds in summer to deeper spawning grounds in winter (IPHC 1998.)

The major spawning grounds for Pacific halibut are in the north Pacific Ocean within the Gulf of Alaska and Bering Sea (IPHC 1998.) During spawning, which generally occurs from November to March, halibut move into deep water, where the eggs are fertilized. The eggs develop into larvae and grow, drifting slowly upward in the water column. During development, the larvae drift great distances with the ocean currents around the northeast Pacific Ocean in a counterclockwise direction (IPHC 1998.) Young fish then settle to the bottom in the shallow feeding areas. Following two to three years in the nursery areas, young halibut generally counter-migrate, moving into more southerly and easterly waters. Because the West Coast includes the southern most range of Pacific halibut and the major spawning grounds are north and west of this area, the population of halibut off the West Coast is significantly smaller than in other areas of its range. Pacific halibut reach maturity at approximately 8 years for males and 12 years for females. The average age of Pacific halibut in the West Coast commercial fishery was 9.6 lb in 1996 (IPHC 1998.)

Adult halibut are demersal, living on or near the bottom. They prefer water temperatures ranging from 3 to 8 degrees Celsius and are generally caught between 90 and 900 feet (27 and 274 m), but have been caught as deep as 1,800 ft (549 m) (IPHC 1998.) Adult halibut prey on cod, sablefish, pollock, rockfish, sculpins, flatfish, sand lance, herring, octopus, crab, and clams (IPHC 1998.) Adult halibut are not generally preyed upon by other species due to their size, active nature and bottom dwelling habits.

Sablefish

The targeted dogfish fishery occasionally intercepts sablefish because they are easily caught with trawl and longline gears. Sablefish (*Anoplopoma fimbria*) are abundant in the north Pacific, from Honshu Island, Japan, north to the Bering Sea, and southeast to Cedros Island, Baja California. There are at least three genetically distinct populations off the West Coast of North America: one south of Monterey characterized by slower growth rates and smaller average size, one that ranges from Monterey to the U.S./Canada border that is characterized by moderate growth rates and size, and one ranging off British Columbia and Alaska characterized by fast growth rates and large size. Large adults are uncommon south of Point Conception (Hart 1973, Love 1991, McFarlane & Beamish 1983a, McFarlane & Beamish 1983b, NOAA 1990).

Adults are found as deep as 1,900 m, but are most abundant between 200 and 1,000 m (Beamish

& McFarlane 1988, Kendall & Matarese 1987, Mason et al. 1983). Off southern California, sablefish were abundant to depths of 1500 m (MBC 1987). Adults and large juveniles commonly occur over sand and mud (McFarlane & Beamish 1983a, NOAA 1990) in deep marine waters. They were also reported on hard-packed mud and clay bottoms in the vicinity of submarine canyons (MBC 1987).

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

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

Yelloweye Rockfish

The targeted dogfish fishery commonly intercepts rockfish, as they are found in similar habitat to spiny dogfish and are easily caught with trawl and longline gear. Under the Sustainable Fisheries Act, the recent overfished species designations of yelloweye rockfish and canary rockfish have caused the Council some concern about the effects of targeted groundfish fisheries on overfished rockfish species. Past management measures to reduce the incidental catch of yelloweye rockfish in longline fisheries are discussed in section 3.3 Human Environment.

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

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

Yelloweye rockfish are ovoviviparous and give birth to live young in June off Washington (Hart

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

Canary Rockfish

The targeted dogfish fishery commonly intercepts rockfish, as they are found in similar habitat to spiny dogfish and are easily caught with trawl and longline gear; however, canary rockfish tend to be more mobile and distributed higher in the water column than yelloweye rockfish and, therefore, do not appear to be as susceptible to incidental harvest by longline gear. Under the Sustainable Fisheries Act, the recent overfished species designations of yelloweye rockfish and canary rockfish have caused the Council some concern about the effects of targeted groundfish fisheries on overfished rockfish species.

Canary rockfish (*Sebastes pinniger*) are found between Cape Colnett, Baja California, and southeastern Alaska (Boehlert 1980, Boehlert & Kappenman 1980, Hart 1973, Love 1991, Miller & Lea 1972, Richardson & Laroche 1979). There is a major population concentration of canary rockfish off Oregon (Richardson & Laroche 1979). Canary primarily inhabit waters 91-183 m deep (Boehlert & Kappenman 1980). In general, canary rockfish inhabit shallow water when they are young and deep water as adults (Mason 1995). Adult canary rockfish are associated with pinnacles and sharp drop-offs (Love 1991).

Canary rockfish tend to be more mobile than yelloweye rockfish and have been known to congregate in schools. Canary rockfish are most abundant above hard bottoms (Boehlert & Kappenman 1980). In the southern part of its range, the canary rockfish appears to be a reef-associated species (Boehlert 1980). In central California, newly settled canary rockfish are first observed at the seaward, sand-rock interface and farther seaward in deeper water (18-24 m).

Canary rockfish are ovoviviparous and have internal fertilization (Boehlert & Kappenman 1980, Richardson & Laroche 1979). Off California, canary rockfish spawn from November-March and from January-March off Oregon and, Washington, (Hart 1973, Love 1991, Richardson & Laroche 1979). The age of 50% maturity of canary rockfish is 9 years; nearly all are mature by age 13. The maximum length canary rockfish grow to is 76 cm (Boehlert & Kappenman 1980, Hart 1973, Love 1991).

Canary rockfish primarily prey on planktonic creatures, such as krill, and occasionally on fish (Love 1991). Canary rockfish feeding increases during the spring-summer upwelling period when euphausiids are the dominant prey and the frequency of empty stomachs is lower (Boehlert et al. 1989).

3.2.3 Protected Species

Endangered Species

West Coast marine species listed as endangered or threatened under the Endangered Species Act (ESA) are listed in Table 3.1 and discussed below in the sections on Marine Mammals, Seabirds, Sea Turtles, and Salmon. Under the ESA, a species is listed as "endangered" if it is in danger of extinction throughout a significant portion of its range and "threatened" if it is likely to become an endangered species within the foreseeable future throughout all, or a significant portion, of its range.

The following species are subject to the conservation and management requirements of the ESA:

Table 3.2.3.1 West Coast Endangered Species
Marine Mammals
Threatened: <ul style="list-style-type: none"> • Steller sea lion (<i>Eumetopias jubatus</i>) Eastern Stock, • Guadalupe fur seal (<i>Arctocephalus townsendi</i>), and • Southern sea otter (<i>Enhydra lutris</i>) California Stock.
Seabirds
Endangered: <ul style="list-style-type: none"> • Short-tail albatross (<i>Phoebastria</i> ('<i>Diomedea</i>) <i>albatrus</i>), • California brown pelican (<i>Pelecanus occidentalis</i>), and • California least tern (<i>Sterna antillarum browni</i>). Threatened: <ul style="list-style-type: none"> • Marbled murrelet (<i>Brachyramphus marmoratus</i>).
Sea Turtles
Endangered: <ul style="list-style-type: none"> • Green turtle (<i>Chelonia mydas</i>) • Leatherback turtle (<i>Dermochelys coriacea</i>) • Olive ridley turtle (<i>Lepidochelys olivacea</i>) Threatened: <ul style="list-style-type: none"> • Loggerhead turtle (<i>Caretta caretta</i>)
Salmon
Endangered: <ul style="list-style-type: none"> • Chinook salmon (<i>Oncorhynchus tshawytscha</i>) Sacramento River Winter; Upper Columbia Spring • Sockeye salmon (<i>Oncorhynchus nerka</i>) Snake River • Steelhead trout (<i>Oncorhynchus mykiss</i>) Southern California; Upper Columbia Threatened: <ul style="list-style-type: none"> • Coho salmon (<i>Oncorhynchus kisutch</i>) Central California, Southern Oregon, and Northern California Coasts • Chinook salmon (<i>Oncorhynchus tshawytscha</i>) Snake River Fall, Spring, and Summer; Puget Sound; Lower Columbia; Upper Willamette; Central Valley Spring; California Coastal • Chum salmon (<i>Oncorhynchus keta</i>) Hood Canal Summer; Columbia River

Table 3.2.3.1 West Coast Endangered Species
<ul style="list-style-type: none"> • Sockeye salmon (<i>Oncorhynchus nerka</i>) Ozette Lake • Steelhead trout (<i>Oncorhynchus mykiss</i>) South-Central California, Central California Coast, Snake River Basin, Lower Columbia, California Central Valley, Upper Willamette, Middle Columbia, Northern California

Marine Mammals

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

There is limited information documenting the interactions of targeted dogfish fisheries and marine mammals off the West Coast, but marine mammals are probably affected by dogfish fisheries. The incidental take of marine mammals, defined as any serious injury or mortality resulting from commercial fishing operations, is reported to NMFS by vessel operators. In the targeted dogfish fisheries, incidental take off the West Coast has not been well-documented, but anecdotal information suggests that encounters are very rare. Indirect effects of targeted dogfish fisheries on marine mammals are more difficult to quantify due to a lack of behavioral and ecological information about marine mammals. However, marine mammals may be affected by increased noise in the oceans, change in prey availability, habitat changes due to fishing gear, vessel traffic in and around important habitat (i.e., areas used for foraging, breeding, raising offspring, or hauling-out), at-sea garbage dumping, and diesel or oil discharged into the water associated with commercial fisheries.

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

Fisheries that interact with species listed as depleted, threatened, or endangered may be subject to management restrictions under the MMPA and ESA. NMFS publishes an annual list of fisheries in the Federal Register separating commercial fisheries into one of three categories, based on the level of serious injury and mortality of marine mammals occurring incidentally in that fishery. The categorization of a fishery in the list of fisheries determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. The targeted dogfish fisheries off the West Coast are in Category III, indicating a remote likelihood of, or no known serious injuries or mortalities, to marine mammals. Based on its Category III status, the incidental take of marine mammals in targeted dogfish fisheries off the West Coast does not have a large impact on marine mammal stocks.

Seabirds

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

Interactions between seabirds and fishing operations are wide-spread and have led to conservation concerns in many fisheries throughout the world. Abundant food in the form of offal (discarded fish and fish processing waste) and bait attract birds to fishing vessels. Seabirds are often taken by longline gear, like the kind used in the targeted dogfish fishery. Around longline vessels, seabirds forage for offal and bait that has fallen off hooks at or near the water's surface and are attracted to baited hooks near the water's surface during the setting of gear. If a bird becomes hooked while feeding on bait or offal, it can be dragged underwater and drowned. Of the incidental catch of seabirds by longline groundfish fisheries in Alaska, northern fulmars represented about 66% of the total estimated catch of all bird species, gulls contributed 18%, Laysan albatross 5%, and black-footed albatross about 4% (Stehn *et al.* 2001). Longline gear and fishing strategies for groundfish in Alaska are similar to dogfish longline fisheries off the West coast.

Besides entanglement in fishing gear, seabirds may be indirectly affected by commercial fisheries in various ways. Change in prey availability may be linked to directed fishing and the discarding of fish and offal. Vessel traffic may affect seabirds when it occurs in and around important foraging and breeding habitat and increases the likelihood of bird storms. In addition, seabirds may be exposed to at-sea garbage dumping and the diesel and oil discharged into the water associated with commercial fisheries.

The FWS is the primary federal agency responsible for seabird conservation and management. NMFS is also required to consult with FWS if fishery management actions may affect seabird species listed as endangered or threatened.

Sea Turtles

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

Sea turtles may be also indirectly affected by commercial fisheries. Sea turtles are vulnerable to collisions with vessels and can be killed or injured when struck, especially if struck with an engaged propeller. Entanglement in abandoned fishing gear can also cause death or injury to sea

turtles by drowning or loss of a limb. The discard of garbage at sea can be harmful for sea turtles, because the ingestion of such garbage may choke or poison them. Sea turtles have ingested plastic bags, beverage six-pack rings, styrofoam, and other items commonly found aboard fishing vessels. The accidental discharge of diesel and oil from fishing vessels may also put sea turtles at risk, as they are sensitive to chemical contaminants in the water.

Salmon

Many Pacific coast salmon species have been listed as endangered or threatened under the ESA (Table 3.1). As mentioned in section 3.2.2, Salmon caught in the U.S. West Coast fishery have life cycle ranges that include coastal streams and river systems from central California to Alaska and oceanic waters along the U.S. and Canada seaward into the north central Pacific Ocean, including Canadian territorial waters and the high seas. Some of the more critical portions of these ranges are the freshwater spawning grounds and migration routes.

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

3.3 Human Environment

The human environment section is subdivided into sub-sections, describing fishery management and fishery sectors for spiny dogfish. Section 3.3.1 provides an overview of fisheries that catch dogfish as either a target species or incidentally. The subsequent sub-sections, 3.3.2 through 3.3.7, describe, respectively, tribal fisheries, non-tribal commercial fisheries, and the recreational fisheries along the West coast.

3.3.1 Spiny Dogfish Fishery Overview

Spiny dogfish are included in the management unit of the Council's West Coast Groundfish Fishery Management Plan (FMP), with implementing regulations set by the National Marine Fisheries Service for federal waters (from 3 to 200 miles offshore). Council has not reviewed nor adopted a formal stock assessment for spiny dogfish, therefore, dogfish fall under the "Other Fish" complex of the Groundfish FMP. The Other Fish stock complex contains all of the unassessed Groundfish FMP species that are neither rockfish (family *Scorpaenidae*) or flatfish. These species include big skate, California skate, leopard shark, longnose skate, soupfin shark, spiny dogfish, finescale codling, Pacific rattail, ratfish, cabezon (north of the California-Oregon border at 42°N. lat.), and kelp greenling.

For many years, the Council has taken a precautionary approach in managing unassessed and poorly assessed stocks and stock complexes. Specifically, for unassessed stocks, Council has adjusted its OYs to 50% of the historical average catch levels; for poorly assessed stocks, the Council has applied a 25% reduction to the assessment value. Council recently discovered that this adjustment had not been applied to Pacific cod and species in the "Other Fish" and "Other Flatfish" complexes. Council rectified this, beginning in 2005, and reduced the "Other Fish" OY

from 14,600 mt (which is the ABC) to 7,300 mt.

3.3.2 West Coast Targeted Dogfish Fisheries

Beginning in 2002, the West Coast targeted dogfish fisheries, have been constrained by provisions to protect overfished rockfish species, primarily yelloweye rockfish and canary rockfish. In 2002, dogfish were prohibited for fixed gear (longline and pot) due to the assumed associated bycatch of yelloweye rockfish. (Note: Bycatch information was collected from fish ticket landings when yelloweye and canary catches were allowed as direct observer information was not available to determine an actual bycatch ratio in an exclusive dogfish fishery.) There are also no longline logbook data to determine the historical area of operation of the fishery. In 2003, the RCA for non-trawl (i.e., fixed gear) fisheries was implemented coastwide. North of 40°10' N. lat., where the longline dogfish fishery occurs, the current non-trawl RCA extends from the shoreline seaward to 100 fms, and the majority of the dogfish catch occurs just inside this closed area.

To date, limited bycatch data have been collected through the NMFS West Coast Groundfish Observer Program on fixed gear fisheries, and data on targeted dogfish fisheries (both longline and trawl) is even more sparse. Updated NMFS observer data enter the Council process annually in April for the previous January-August period, and NMFS has indicated that higher coverage levels on fixed gear fisheries is anticipated. However, even with higher coverage levels, as groundfish fisheries are constrained by their respective RCA boundaries, and fishers are prohibited from retaining overfished species, data collected from areas outside the RCA will become even more limited.

West Coast trawl and fixed gear groundfish fisheries occur coastwide, year-round; however, the targeted longline dogfish fishery has historically taken place between February and May, and primarily off the northern Washington coast. About 8-10 Washington-based longline fishers participate in the longline targeted dogfish fishery per year. Trawl vessels have historically targeted dogfish, and a few vessels will sporadically land dogfish throughout the year. There is one major processor, located in Bellingham, that is heavily dependent upon spiny dogfish. These fishers and this processor have worked aggressively to develop and maintain strong markets for dogfish, primarily overseas.

3.3.3 Tribal Fisheries

Four coastal western Washington tribes possess and exercise treaty fishing rights to groundfish. A specific tribal allocation for spiny dogfish has not been developed nor implemented and tribal dogfish landings have been relatively insignificant (0.1% of the total West Coast landings) from 1990 to present (see Table 3.3.3.1).

Table 3.3.3.1 Washington coastal tribal spiny dogfish landings (mt), 1990-2004 (Note: Years not listed had zero to trace amounts of spiny dogfish landings.)

Year	Landings
1990	0.4

1991	3.5
1996	2.5
1999	0.4
2000	2.8
2002	1.2
2003	3.8
2004	40.1

3.3.4 Non-Tribal Commercial Fisheries

Spiny dogfish are targeted by trawl and longline fisheries on the West Coast, and are generally limited by market availability. By far, the majority of the spiny dogfish fishing activity occurs in the International North Pacific Fisheries Commission (INPFC) Vancouver area (see Table 3.3.4.1).

Table 3.3.4.1 Coastal spiny dogfish landings (mt) by INPFC area and gear type (setnet included with trawl for Monterey and Conception areas).

		Vancouver	Columbia	Eureka	Monterey	Conception	Total
1990	Longline	132	3	-	-	-	476
	Trawl	340	1	-	-	-	
1991	Longline	208	-	-	-	-	901
	Trawl	669	24	-	-	-	
1992	Longline	177	-	-	-	-	1094
	Trawl	868	47	-	1	1	
1993	Longline	416	-	-	-	-	1259
	Trawl	808	35	-	-	-	
1994	Longline	337	-	-	-	-	1392
	Trawl	959	96	-	-	-	
1995	Longline	7	-	-	-	-	366
	Trawl	316	43	-	-	-	
1996	Longline	53	-	-	-	-	250
	Trawl	182	15	-	-	-	
1997	Longline	82	-	1	-	3	425
	Trawl	335	4	-	-	-	
1998	Longline	-	-	-	-	-	458
	Trawl	405	50	1	1	1	
1999	Longline	44	-	-	-	-	495
	Trawl	406	32	1	7	5	
2000	Longline	318	-	-	-	-	625
	Trawl	279	19	1	6	2	
2001	Longline	218	-	-	-	-	566
	Trawl	334	11	-	1	2	
2002	Longline	409	-	-	-	-	875

2003	Trawl	439	11	-	16	-	443
	Longline	237	-	-	-	-	
2004	Trawl	195	-	-	1	10	404
	Longline	225	-	-	-	-	
	Trawl	145	8	-	20	6	

Source: PacFIN extraction 1/18/05

Non-tribal trawl and longline dogfish landings into Washington, by far, have made up the majority of the West Coast-wide dogfish landings, and have been a significant portion of the total coastwide landings, in recent years (Table 3.3.4.2).

Table 3.3.4.2 Non-tribal spiny dogfish longline landings (mt) into Washington, 2000-2004.

Year	Landings	% of Longline	% of Total
2000	268	84%	43%
2001	188	86%	33%
2002	376	92%	43%
2003	231	97%	52%
2004	205	91%	51%

3.3.5 Recreational Fisheries

Spiny dogfish are generally not targeted by sport fisheries on the West Coast. However, due to the voracious feeding nature of spiny dogfish, they tend to be caught incidentally in all recreational fisheries, and are generally considered a nuisance by anglers.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

This section examines the environmental consequences that could be expected to result from adoption of each of the alternatives. As discussed in Chapter 1.0, Purpose and Need for Action, the purpose in and need for considering the actions analyzed in this document are to:

- Constrain commercial harvests in 2006 to levels that will ensure the spiny dogfish stock, and co-occurring species, are maintained at, or restored to, sizes and structures that will produce the highest net benefit to the nation, while balancing environmental and social values
- Ensure spiny dogfish is harvested within ABC/OY limits during 2006 and in a manner consistent with the aforementioned Groundfish FMP and National Standards Guidelines (NSGs) (50 CFR 600 Subpart D), using routine management tools available to the

specifications and management measures process (FMP at 6.2.1, 50 CFR 660.370(c)). Chapter 10 of this EA describes how the proposed action (preferred alternative) is consistent with the FMP and MSA

Therefore, this section will consider the environmental effects of establishing trip limits for spiny dogfish, beginning in 2006.

This section forms the analytic basis for the comparison of issues across the alternatives detailed in Chapter 2.0. The potential of each alternative to affect one or more components of the human environment is discussed in this section; direct and indirect effects of the alternatives are discussed in this analysis. Direct effects are caused by an action and occur at the same time and place as the action, while indirect effects occur later in time and/or further removed in distance from the direct effects (40 CFR 1508.27). Examples of direct effects of some of the alternatives to the issues analyzed in this EA might include the effects of a trip limit on individual fishing practices and income derived from targeted dogfish fishing. Examples of indirect effects analyzed in this EA might include increased or decreased fishing pressure on spiny dogfish stocks.

4.1 Physical Impacts of the Alternatives

Physical impacts generally associated with fishery management actions are effects resulting from changes in the physical structure of the benthic environment as a result of fishing practices (e.g. gear effects and fish processing discards). Although dogfish fishing activity affects the physical environment, none of the alternatives to any of the issues detailed in this EA are expected to have notable or measurable effects on the physical environment, either individually or cumulatively. Establishing trip limits for dogfish would slow the harvest rate from status quo (which is unlimited fishing, year-round); therefore, this action could result in potential positive effects on the physical environment.

4.2 Biological Impacts of the Alternatives

The biological impacts generally associated with fishery management actions are effects resulting from: 1) harvest of fish stocks that may result in changes in food availability to predators, changes in population structure of target fish stocks, and changes in community structure; 2) entanglement and/or entrapment of non-target organisms in active or inactive fishing gear; 3) major shifts in the abundance and composition of the marine community as a result of fishing pressure.

In this section, the alternatives in this EA are examined for their potential effects on the biological environment. The primary areas where the establishment of trip limits could affect the environment are the effects on: 1) the portion of the spiny dogfish stock occurring off the West Coast; 2) overfished groundfish stocks, particularly yelloweye and canary rockfish; 3) threatened and endangered salmon stocks; and 4) seabirds. However, as mentioned above, since trip limits are proposed to reduce the harvest rate from status quo (which is an unlimited, year-round fishery), the effects on these areas would likely be positive, rather than negative.

Table 4.2.1 Effects of the Alternatives on the Biological Environment				
	Effects on Spiny Dogfish Stock Occurring in West Coast	Effects on Yelloweye and/or Canary Rockfish	Effects on Threatened and Endangered Salmon Stocks	Effects on Seabirds
Alternative 1 (Status quo/No Action) No trip limits; unlimited harvesting year-round	Unknown	Status quo fishing regime is not expected to have any effects on yelloweye or canary rockfish.	Status quo fishing regime is not expected to have any effects on salmon stocks.	Status quo fishing regime is not expected to have any effects on seabirds.
Alternative 2 Establishment of trip limits for spiny dogfish that accommodate current harvest levels	Establishing trip limits is expected to slow down the harvest rate, and potential overall harvest, of spiny dogfish, which may have a positive effect on the dogfish stock	Establishing trip limits is not expected to have any negative effects on yelloweye or canary rockfish, but may potentially reduce yelloweye and canary rockfish bycatch.	Establishing trip limits is not expected to have any effects on salmon stocks.	Establishing trip limits is not expected to have any effects on seabirds.
Alternative 3 Establishment of more conservative trip limits for spiny dogfish that may constrain one or more fisheries	Establishing trip limits is expected to slow down the harvest rate, and potential overall harvest, of spiny dogfish, which may have a positive effect on the dogfish stock	Establishing trip limits is not expected to have any negative effects on yelloweye or canary rockfish, but may potentially reduce yelloweye and canary rockfish bycatch.	Establishing trip limits is not expected to have any effects on salmon stocks.	Establishing trip limits is not expected to have any effects on seabirds.

4.2.1 Effects of the Alternatives on the Spiny Dogfish Population off the West Coast

As discussed above in Chapter 3.0, the spiny dogfish population off the West Coast is a portion of the overall spiny dogfish stock that ranges from the Bering Sea to Baja California. Annual harvest amounts are set by Council for the Other Fish stock complex, which includes spiny dogfish. None of the alternatives considered within this EA will have a negative effect on the amount of spiny dogfish taken off the West Coast, when compared to the amounts that have been historically harvested.

The alternatives consider the amount of dogfish that can be harvested in a two-month period, under current regulations (i.e., while adhering to the boundaries of the applicable RCA). Given the migratory nature of dogfish, which travel in large schools typically following feed, the locations of dogfish are somewhat unpredictable from year to year. Fishers who have historically targeted dogfish operate in a general area in which dogfish congregate during the early spring months (from mid-February through early May) which is around the 100-fm isobath. Since there is currently no trip limit established for dogfish, having trip limits in place could positively affect the spiny dogfish population off the West Coast.

4.2.2 Effects of the Alternatives on Yelloweye and Canary Rockfish Stocks

None of the alternatives are expected to have any measurable effects on yelloweye or canary rockfish, although Alternatives 2 and 3 may reduce bycatch from status quo. Both stocks are widely distributed off the West Coast of North America, with yelloweye rockfish occurring from the Aleutian Islands to Baja California and canary rockfish occurring from southeastern Alaska to Baja California. Thus, establishing trip limits for dogfish within a small portion of the ranges of both of these rockfish species should have little to no effect on the populations of either species; in any event, the effects would likely be positive, as fishers may be constrained by the trip limit and may take fewer and/or shorter fishing trips as a result.

4.2.3 Effects of the Alternatives on Threatened and Endangered Salmon Stocks

None of the alternatives are expected to have any measurable effects on threatened or endangered salmon stocks. During the spring months when dogfish are congregated in large schools, both wild and hatchery salmon stocks are found feeding off the northern West Coast, particularly fall run stocks, which are those runs of salmon that travel upriver to spawn in the fall. Establishing trip limits is not expected to have any measurable effects on salmon; the difference among the alternatives in their effects on salmon is not measurable and is expected to be negligible.

4.2.4 Effects of the Alternatives on Seabirds

The alternatives would not alter the number of vessels participating in fisheries off the West Coast; thus, neither of these alternatives is expected to have any measurable effects on West Coast seabirds. To the extent that the targeted dogfish fisheries affect seabirds, the difference among the alternatives in how they affect seabirds is likely not measurable.

There is little data now available on the bycatch of seabirds in West Coast groundfish fisheries. However, the NMFS Northwest Fisheries Science Center is collecting information on bycatch of seabirds and other protected species as one component of its new observer program for the West Coast groundfish fisheries. This observer program began in August 2001 and, as the observer program develops a larger information base on groundfish fisheries interactions with seabirds, the agency will be better able to evaluate the effects of fisheries management changes on seabirds.

4.3 Socio-Economic Impacts of the Alternatives

The socio-economic impacts generally associated with fishery management actions are effects resulting from: 1) changes in harvest availability and processing opportunities that may result in unstable income opportunities; 2) changes to access privileges associated with license limitation and individual quota systems; 3) fishing season timing or structure restrictions that may improve or reduce the safety of fishing activity; 4) fishing season timing or structure restrictions that may or may not take into account the social and cultural needs of fishery participants. Of these elements, proposed alternatives and implementing regulations would not affect current access privileges.

In this section, alternative regulations are examined for their potential socio-economic effects. The primary areas where the alternatives could affect fishing industries and communities are: 1) on fishery participant safety; 2) on harvest and income opportunities; and, 3) on the costs to vessels of participating in the fisher. In addition to these industry and community effects, the alternatives could affect the management of the fishery and enforcement of regulatory measures. Table 4.3.1 details these effects in a matrix format.

Table 4.3.1 Effects of the Alternatives on the Socio-Economic Environment				
	Effects on Fishery Participant Safety	Effects on Harvest and Income Opportunities	Effects on Cost of Participating in Fishery	Effects on Management and Enforcement
Alternative 1 (Status quo/No Action) No trip limits; unlimited harvesting year-round	Is not expected to have any effect on vessel safety.	Given migratory nature of dogfish, fishing opportunity and incomes are currently constrained by RCA, but not by harvest limits.	Is not expected to have any effect on cost of participating in fishery	Continued management of the dogfish fishery without harvest limits could result in unanticipated participation in the open access fishery, which could affect the amount of dogfish harvest and potential bycatch of overfished rockfish. This concern is currently addressed through bycatch caps on canary and yelloweye rockfish that were established for the open access sector through emergency rule. If achieved, those bycatch caps could constrain other open access fisheries. No enforcement issues.
Alternative 2 Establishment of trip limits for spiny dogfish that accommodate current harvest levels	Is not expected to have any effect on vessel safety.	Fishing opportunity and incomes is not expected to vary from status quo as trip limits accommodate current harvest levels and RCAs would remain in place.	Is not expected to have any effect on cost of participating in fishery	It is anticipated that these trip limits would accommodate current harvest levels by the vessels that have historically targeted spiny dogfish. These trip limits, however, would be a deterrent for large factory vessels to participate in the open access fishery and would address harvest rate of spiny dogfish and associated bycatch of overfished rockfish; therefore, setting bycatch caps for the open access fishery for canary and yelloweye rockfish would not be needed to address unanticipated effort in the targeted dogfish fishery. No enforcement issues.
Alternative 3 Establishment of more conservative trip limits for spiny dogfish that may constrain one or more fisheries	Is not expected to have any effect on vessel safety.	Fishing opportunity and incomes may be slightly constrained for a few vessels in one or more fisheries, and RCAs would remain in place.	Is not expected to have any effect on cost of participating in fishery	It is anticipated that these trip limits would accommodate current harvest levels by the vessels that have historically targeted spiny dogfish. These trip limits, however, would be a deterrent for large factory vessels to participate in the open access fishery and would address harvest rate of spiny dogfish and associated bycatch of overfished rockfish; therefore, setting bycatch caps for the open access fishery for canary and yelloweye rockfish would not be needed to address unanticipated effort in the targeted dogfish fishery. No enforcement issues.

4.3.1 Effects on Fishery Participant Safety

Alternative 2 establishes trip limits that accommodate current harvest levels and Alternative 3 establishes more conservative trip limits; however, both alternatives retain the current boundaries of the trawl and non-trawl RCAs. Because of this, access to fishing grounds is the

same as under status quo. All of these alternatives are not expected to have any effect on vessel safety.

4.3.2 Effects on Fishery Participant Harvest and Income Opportunities

As Alternative 2 accommodates current harvest levels, it is not anticipated to have any effect on fishing harvest and income opportunities for those vessels that have historically targeted dogfish. Alternative 3 establishes more conservative trip limits, which may be constraining for a few vessels in one or more fisheries. New entrants in the open access fishery, especially larger factory vessels, may be constrained by both Alternatives 2 and 3.

4.3.3 Effects on Cost of Participating in the Fishery

Costs of participating in this fishery is not expected to change under the different alternatives.

4.3.4 Effects on Management and Enforcement

In recent years, fishermen targeting dogfish have been constrained by their assumed bycatch of yelloweye and canary rockfish, two overfished species managed under rebuilding plans. To provide protection for these overfished stocks, seasonally-variable and gear-specific closed areas, or rockfish conservation areas (RCAs), have been implemented. The RCAs off the Washington coast generally encompass the area between 100-200 fm for trawl gears and 0-100 fm for limited entry and open access fixed gears. The spiny dogfish fishery occurs around the 100-fm isobath, and dogfish are targeted by both trawl and non-trawl gears.

Since effort is not limited, especially in the open access fishery, there is a potential to overharvest dogfish and/or exceed the projected bycatch associated with the fishery, even with the RCAs in place. To address the potential of exceeding the estimated amounts of canary and yelloweye rockfish bycatch, which was anticipated for the open access fishery in 2005, the National Marine Fisheries Service (NMFS) adopted an emergency rule in early May to set bycatch limits for the directed groundfish open access fishery. These limits were originally set at 1.0 mt for canary rockfish and 0.6 mt for yelloweye rockfish, and subsequently raised inseason to 3.0 mt of each species, based on updated projections using NMFS West Coast Groundfish Observer Program data.

It is expected that the proposed trip limits in Alternatives 2 and 3 would represent a deterrent to large factory vessels to participate in the open access fishery. Under status quo, such unanticipated participation could result in overharvest of spiny dogfish as well as exceeding the estimated bycatch amounts of overfished species for the targeted dogfish fishery. It is anticipated that, if either Alternative 2 or 3 were selected, the Council could manage bycatch in the open access fishery by projecting amounts pre-season, rather than continue the use of bycatch limits in 2006.

A formal stock assessment for west coast dogfish has not yet been conducted, but one is recommended for the next assessment cycle (2007). Even in the absence of a formal assessment, life history information (slow growing, late maturing, and low fecundity) indicates spiny dogfish are easily overfished. Dogfish populations have been depressed as a result of fishing in areas of

Puget Sound and have been declared overfished on the East Coast.

Under the current management regime, Council adopts annual OYs for groundfish stocks and stock complexes managed under the Groundfish FMP. Spiny dogfish are part of the Other Fish stock complex and are subject to the overall OY of 7,300 mt adopted for the complex. This OY is the result of applying a precautionary reduction of 50% to historical catch levels, per the Council's policy for precautionary management for unassessed and poorly assessed stocks. Using the NMFS observer data and catch data from other sources (e.g., state-sponsored EFPs, NMFS triennial trawl survey, and independent research efforts), the Council's Groundfish Management Team develops and recommends management measures for the commercial and recreational directed groundfish fisheries, including the longline dogfish fishery. Management measures are typically based on bycatch assumptions of overfished rockfish, so as to not exceed a rebuilding OY for an overfished stock.

Routine monitoring of the fishing fleet is used to ensure that vessel operators comply with fisheries regulations. Traditional monitoring techniques include the monitoring of fisheries from air and surface craft, observer programs and analysis of catch records and vessel logbooks. The efficiency of these surveillance techniques can be dramatically enhanced by the addition of vessel monitoring systems (VMS). VMS is a tool that is commonly used to monitor vessel activity in relationship to geographically defined management areas where fishing activity is restricted. VMS transmitters installed aboard each vessel automatically determine the vessel's location and transmit that position to a processing center via a communication satellite where the information is validated and analyzed before being disseminated for fisheries management, surveillance and enforcement purposes. Transmitters are designed to be tamper resistant and automatic. All alternatives require the enforcement of area restrictions, depicted by a series of waypoints. Currently, VMS is required on all limited entry vessels, but not open access vessels. The Council is addressing expanded VMS coverage to apply to one or more of the open access sectors.

4.4 Cumulative Effects

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

Potential direct and indirect effects of the alternatives being considered are detailed above and summarized in Tables 4.2.1 and 4.3.1.

Of the past, proposed, and reasonably foreseeable future actions that are expected to also affect these same waters, the most notable is the action to implement Pacific Coast groundfish fishery management measures for 2006. Fishing for dogfish occurs in the same waters and affects the same habitats as fishing for other Pacific Coast groundfish species. The effects of the 2006 groundfish specifications and management measures have been described and analyzed by Council staff in an Environmental Impact Statement (completed in October 2004). Actions considered in this EA on spiny dogfish management are not expected to have effects on the

environment that, when considered in combination with groundfish specifications and management measures, measurably alter the effects of the groundfish specifications and management measures. Colloquially, the effects of spiny dogfish management measures are a “drop in the bucket” when considered in combination with the effects of groundfish management measures. The preferred alternative is intended to keep dogfish fishery management compatible with groundfish management of similar commercial fisheries. Trip limits considered in this document are primarily intended to manage the harvest rate of dogfish and protect yelloweye rockfish, an overfished groundfish species.

5.0 OTHER APPLICABLE LAW

5.1 Endangered Species Act

Section 7(a)(2) of the Endangered Species Act, as amended, requires that federal agencies “shall, in consultation with and with the assistance of the Secretary [of Commerce or Interior], insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species, or result in the destruction or adverse modification of habitat of such species....” Based on this section of the law (Section 7), action agencies consult with NMFS (for marine species) or FWS (for terrestrial and freshwater species) in cases where a “major construction activity” (which is considered equivalent to the “major federal action” standard under NEPA) could “jeopardize the continued existence” of an endangered species. For fishery management actions in federal waters, NMFS is both the action and consulting agency (although different divisions fulfill these two roles.) Consultations can begin informally, through “phone contacts, meetings, conversations, letters, project modifications and concurrences...” {USFWS and NMFS, 1998 #557}. During consultations, if the lead agency is informed that listed species or critical habitat may be present in the action area, it prepares a biological assessment to disclose the likely adverse effects. This EA contains the information necessary for a biological assessment of the effects of the proposed action on ESA-listed species occurring in the action area. If the action agency determines that the proposed action may affect listed species or designated critical habitat, formal consultation is required. The consulting agency (in this case, NMFS) must issue a Biological Opinion (or BiOp) within 135 days of the initiation of formal consultation. The BiOp may contain “reasonable and prudent measures” that the action agency must implement (in addition to any proposed mitigation) to ensure the proposed action does not jeopardize the continued existence of the species in question. (These may be referred to as “no jeopardy standards.” The Council manages ocean salmon fisheries in part based on such standards for listed salmon species.)

The proposed alternatives do not constitute an action that may affect endangered/threatened species listed under the Endangered Species Act (ESA) or their habitat within the meaning of the regulations implementing Section 7 of the ESA.

5.2 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) of 1972 and the ESA are the principle federal laws guiding marine mammal species protection and conservation policy in the United States. Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of

whales, dolphins, porpoise, seals, sea lions, and fur seals while the FWS is responsible for walrus, sea otters, and the West Indian manatee.

Section 118 of the MMPA requires that NMFS publish, at least annually, a list of fisheries placing all U.S. commercial fisheries into one of three categories describing the level of incidental serious injury and mortality of marine mammals in each fishery, with Category I having the highest level of injury and mortality. Definitions of the fishery classification criteria for Categories I, II, and III fisheries are found in the implementing regulations for section 118 of the MMPA (50 CFR part 229.) Groundfish longline fisheries off the West Coast are considered Category III fisheries, where the annual mortality and serious injury of a stock by the fishery is less than or equal to 1% of the PBR level.

Under the MMPA, marine mammals whose abundance falls below the optimum sustainable population level (usually regarded as 60% of carrying capacity or maximum population size) can be listed as “depleted.” Populations listed as threatened or endangered under the ESA are automatically depleted under the terms of the MMPA. Currently off the West coast of the United States, the Stellar sea lion (*Eumetopias jubatus*) Eastern stock, Guadalupe fur seal (*Arctocephalus townsendi*), and the Southern sea otter (*Enhydra lutris*) California stock are listed as threatened under the ESA and the sperm whale (*Physeter macrocephalus*) WOC stock, humpback whale (*Megaptera novaeangliae*) WOC-Mexico stock, blue whale (*Balaenoptera musculus*) Eastern north Pacific stock, and Fin whale (*Balaenoptera physalus*) WOC stock are listed as depleted under the MMPA. Any species listed as endangered or threatened under the ESA is automatically considered depleted under the MMPA.

Based on its Category III status, incidental takes of these protected species in the West Coast longline dogfish fisheries are well under their annual PBR levels. None of the proposed alternatives, discussed above, are likely to affect the incidental mortality levels of species protected under the MMPA.

5.3 Migratory Bird Treaty Act and EO 13186

The Migratory Bird Treaty Act (MBTA) of 1918 was enacted to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished populations of many native bird species. The Act states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The Migratory Bird Treaty Act prohibits the directed take of seabirds, but the incidental take of seabirds in the longline groundfish fishery does occur.

Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) supplements the MBTA by requiring Federal agencies to work with the U.S. Fish and Wildlife Service to develop memoranda of understanding (MOU) to conserve migratory birds. NMFS is scheduled to implement its MOU by January 2003. The protocols developed by this consultation will guide agency regulatory actions and policy decisions in order to address this conservation goal. EO 13186 also directs agencies to evaluate the effects of their actions on migratory birds in environmental documents prepared pursuant to the National Environmental Policy Act.

The proposed alternatives are not expected to increase the incidental take of seabirds in West Coast dogfish fisheries.

5.4 Paperwork Reduction Act

In response to public complaints about the burden of federal paperwork, the Paperwork Reduction Act (PRA) and its implementing regulations require federal agencies to obtain clearance from the OMB if they plan to collect information from the public. Collecting facts and opinions from ten or more people, by means of a survey for example; requiring individuals to provide information to the general public or to some third party; requiring items (e.g., boxes of fish, fishing gear) or vessels to be labeled or marked; or using technological methods to monitor public compliance with government requirements, including automated collection techniques such as VMS, are all covered by the law and regulations.

The PRA requires agencies to compile an Information Collection Budget (ICB), the total burden the agency will be placing on the public, and to obtain OMB clearance by submitting an OMB-83I form (Paperwork Reduction Act Submission) and a supporting statement. The ICB is submitted annually and lists all new information collecting the agency plans for the upcoming fiscal year. As part of the ICB, for each planned collection the agency must describe the purpose of the collection, the approximate number of respondents, and the estimated time taken per respondent. If a proposed rule contains an information collection requirement needing clearance under the PRA, a clearance request needs to be submitted to OMB on or before the date the proposed rule is published in the Federal Register. Once OMB receives the request, it has 60 days to review and act on it.

None of the proposed alternatives contain a collection of information and are, therefore, not subject to the requirements of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*

5.5 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act (CZMA) of 1972 requires all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable.

The proposed action is consistent to the maximum extent practicable with applicable State coastal zone management programs. This determination has been submitted to the responsible state agencies for review under section 307(c)(1) of the CZMA by forwarding a copy of this EA to each of the relevant state agencies.

5.6 EO 12898 (Environmental Justice)

Executive Order 12898 obligates federal agencies to identify and address “disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the United States” as part of any overall environmental analysis associated with an action. NOAA guidance, NAO 216-6, at '7.02, states that “consideration of E.O. 12898 should be specifically included in the NEPA documentation for

decision-making purposes.” Agencies should also encourage public participation, especially by affected communities as part of a broader strategy to address environmental justice issues.

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

The proposed alternatives are not expected to affect minority and low-income communities. West Coast groundfish tribes are part of the Council’s decision-making process on groundfish management issues and tribes with treaty rights to salmon, groundfish, or halibut have a seat on the Council. None of the proposed alternatives affect the timing or management flexibility of any of the tribal fisheries for groundfish.

5.7 EO 13132 (Federalism)

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

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

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

5.8 EO 13175 (Consultation and Coordination with Indian Tribal Governments)

Executive Order 13175 is intended to ensure regular and meaningful consultation and

collaboration with tribal officials in the development of federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates on Indian tribes.

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

The U.S. government formally recognizes that the four Washington Coastal Tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish. Each of the treaty tribes has the discretion to administer their fisheries and to establish their own policies to achieve program objectives. Accordingly, tribal groundfish allocations and regulations have been developed in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus.

6.0 REGULATORY FLEXIBILITY ACT AND EO 12866 (Regulatory Impact Review)

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

6.1 EO 12866 (Regulatory Impact Review)

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

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

NMFS requires the preparation of an RIR for all regulatory actions of public interest, including any changes to West Coast groundfish management. The RIR provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure the regulatory agency systematically and comprehensively considers all available alternatives, so the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of EO 12866.

The RIR analysis and an environmental analyses required by NEPA have many common elements, including a description of the management objectives, description of the fishery, statement of the problem, description of the alternatives and economic analysis, and have, therefore, been combined in this document.

The proposed alternatives are not a significant action according to EO 12866. This action will not have a cumulative effect on the economy of \$100 million or more nor will it result in a major increase in costs to consumers, industries, government agencies, or geographical regions. No significant adverse impacts are anticipated on competition, employment, investments, productivity, innovation, or competitiveness of U.S.-based enterprises. The gross revenues generated from dogfish fisheries coastwide are not expected to differ substantially as a result of the proposed alternatives.

6.2 Regulatory Flexibility Act

The RIR is also designed to determine whether the proposed rule has a “significant economic impact on a substantial number of small entities” under the Regulatory Flexibility Act. The Regulatory Flexibility Act (RFA), 5 U.S.C. 603 *et seq.*, requires government agencies to assess the effects that various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those effects. A fish-harvesting business is considered a "small" business by the Small Business Administration (SBA) if it has annual receipts not in excess of \$3.0 million. For related fish-processing businesses, a small business is one that employs 500 or fewer persons. For marinas and charter/party boats, a small business is one with annual receipts not in excess of \$5.0 million. All of the businesses that would be affected by this action are considered small businesses under SBA guidance.

The purpose of the RFA is to relieve small businesses, small organizations, and small governmental entities of burdensome regulations and record-keeping requirements. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action. An initial regulatory flexibility analysis (IRFA) is conducted unless it is determined that an action will not have a "significant economic impact on a substantial number of small entities.”

Proposed alternatives will affect directed non-tribal commercial fisheries off the northern coast of Washington. The proposed alternatives are insignificant and are expected to result in either no impact at all, or a modest increase in access to spiny dogfish fishing areas for commercial fishermen and operators. These changes do not include any reporting or recordkeeping requirements. These changes will also not duplicate, overlap or conflict with other laws or regulations. Consequently, these alternatives are not expected to meet any of the RFA tests of having a "significant" economic effect on a "substantial number" of small entities. Therefore, a regulatory flexibility analysis was not prepared.

7.0 LIST OF PREPARERS AND BIBLIOGRAPHY

7.1 List of Preparers

Michele Culver and Brian Culver, WDFW, provided fishery-specific data and background information, with administrative oversight and contributions from Merrick Burden, Yvonne DeReynier, and Jamie Goen, NMFS.

This EA/RIR was prepared in coordination and consultation with the National Marine Fisheries Service, Pacific Fishery Management Council, the Northwest Indian Fisheries Commission, the California Department of Fish and Game, and the Oregon Department of Fish and Wildlife.

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