Expanded Coverage of the Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery

(Tiered from "The Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery" - July 2003)

Draft Environmental Assessment, Regulatory Impact Review & Regulatory Flexibility Analysis

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Abstract: This environmental assessment examines alternative Vessel Monitoring System (VMS) coverage levels for vessels that fish pursuant to the harvest guidelines, quotas, and other management measures governing the open access (OA) groundfish fishery in federal waters. To ensure the integrity of groundfish conservation areas (GCAs), a pilot VMS program was implemented on January 1, 2004. The pilot program requires vessels registered to Pacific Coast groundfish fishery limited entry (LE) permits to carry and use NMFS type-approved VMS transceiver units while fishing off the coasts of Washington, Oregon and California.

Large-scale depth-based management areas, referred to as GCAs, are used to prohibit or restrict commercial groundfish fishing. These areas were specifically designed to protect overfished species while allowing healthy fisheries to continue in areas and with gears where little incidental catch of overfished species occurs. Groundfish conservation area boundaries are defined by points of latitude and longitude. The rockfish conservation areas, a sub-group of groundfish conservation areas, are defined by points that approximate fathom curves for depth ranges where overfished rockfish species are commonly found. It is difficult and costly to effectively enforce these large scale area closures using traditional enforcement methods, particularly when the boundaries are defined by numerous points of latitude and longitude and when management measures allow some gear types and target fishing in all or a portion of the conservation area. Scarce state and federal resources also limit the use of traditional enforcement methods. Expanding coverage of the current VMS monitoring program to the OA fisheries is expected to enhance state and federal enforcement's ability to monitor vessel compliance with depth-based conservation areas.

October 2005

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1.0 INTRODUCTION

The groundfish fishery in the Exclusive Economic Zone (EEZ), 3 to 200 nautical miles (nm) off of the Washington-Oregon-California (WOC) coast is managed under the Pacific Coast Groundfish Fishery Management Plan (FMP). The Pacific Coast Groundfish FMP was prepared by the Pacific Fishery Management Council (Council) under the authority of the Magnuson Fishery Conservation and Management Act (subsequently amended and renamed the Magnuson-Stevens Fishery Conservation and Management Act). The Pacific Coast Groundfish FMP was approved by the Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration, on January 4, 1982 and became effective on September 30, 1982.

Actions taken to amend FMPs or to implement regulations to govern the groundfish fishery must meet the requirements of various federal laws, regulations, and executive orders. In addition to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), these federal laws, regulations, and executive orders include: National Environmental Policy Act (NEPA), Regulatory Flexibility Act (RFA), Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), Coastal Zone Management Act (CZMA), Paperwork Reduction Act (PRA), Executive Orders (E.O.) 12866,12898, 13132, and 13175, and the Migratory Bird Treaty Act (MBTA).

The regulations that implement NEPA requirements permit NEPA documents to be combined with other agency documents to reduce duplication (40 CFR§1506.4). NEPA, E.O. 12866 and the RFA require a description of the purpose and need for the proposed action as well as a description of alternative actions that may address the identified issue. The purpose and need for this action and general background materials are included in Section 1 of this document. Section 2 describes a reasonable range of alternative management actions that may be taken to address the identified issue. In accordance with NEPA requirements, Section 3 contains a description of the physical, biological and socio-economic characteristics of the affected environment. Section 4 examines the physical, biological and socio-economic impacts of the management options as required by NEPA, E.O. 12866 and the RFA. Section 5 addresses the consistency of the proposed actions with the FMP, Magnuson-Stevens Act, ESA, MMPA, CZMA, PRA, E.O. 12866, E.O. 13175 and the MBTA. Section 6 provides: a Regulatory Impact Review, which is required by E.O. 12866 to address the economic significance of the action, and; a Regulatory Flexibility Analysis, which is required by the RFA to addresses the impacts of the proposed actions on small businesses. Section 7 presents a list of individuals who assisted in preparing the Environmental Assessment (EA) and Section 8 is the list of references. The NEPA conclusions are addressed in a memorandum that accompanies this document.

1.1 Proposed Action

The proposed action is to expand the existing VMS program into the OA sectors of the groundfish fishery. This EA examines alternative VMS coverage levels for vessels that are used to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery in federal waters. With VMS coverage, vessels would be required to carry and use a mobile VMS transceiver unit, and to identify their intent to fish within a conservation area, in a manner that is consistent with federal conservation area requirements.

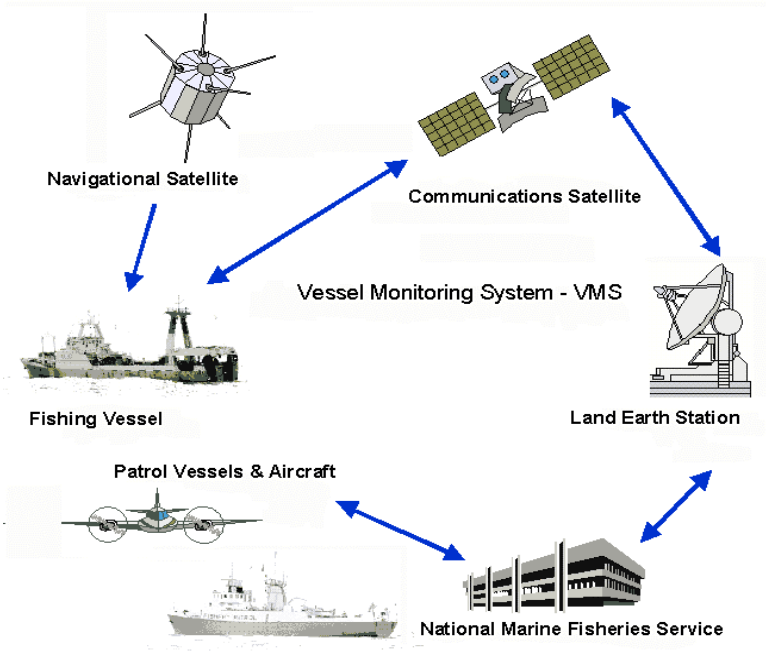

Figure 1.1. Example VMS Scenario

1.2 Background

VMS is a tool that is commonly used to monitor vessel activity in relationship to geographically defined areas. VMS transceivers are installed aboard vessels and use Global Positioning System (GPS) satellites to determine the vessel's position and to transmit that position to a communications satellite. From the communications satellite, the vessel's position is transmitted to a land-earth station operated by a communications service company. From the land-earth station, the position is transmitted to the NMFS Office for Law Enforcement (OLE) processing center. At the OLE processing center, the information is validated and analyzed before being disseminated for surveillance, enforcement purposes, and fisheries management. Figure 1.1 illustrates the flow of information through a VMS system.

VMS transceivers document a vessel's position at a specific period in time. The frequency at which position reports are sent depends on the defined need. Position transmissions can be made on a predetermined schedule, such as hourly, or upon request from the processing center. The vessel operator is unable to alter the VMS transmission signal or the time of transmission. In most cases, the vessel operator is unaware of exactly when the VMS unit is transmitting. VMS transceivers are designed to be tamper resistant.

To assure compatibility with the national monitoring center, NMFS requires that VMS systems meet defined standards (September 23, 1993, 58 FR 49285, March 31, 1994, 59 FR 151180), while recognizing the need to promulgate regulations and approve systems on a fishery-by-fishery basis. VMS transceiver units approved by NMFS are referred to as type-approved models. All type-approved models must have basic features identified and endorsed by NMFS; however, additional features may be added to better meet the needs of a particular fishery. On November 17, 2003 (68 FR 64860,) NMFS published a notice identifying VMS transceiver units and communication service providers that are type-approved for the Pacific Coast groundfish fishery.

Amendment 13 to the Pacific Coast Groundfish FMP recognized the value of VMS as a tool for enforcing closed areas that are established to reduce bycatch of overfished species. Amendment 13 also identified VMS as a technological tool that could be used to improve bycatch management by providing fishing location data that can be used in conjunction with observer data collections. Amendment 18 to the FMP would provide more specific details on the use of VMS as a vessel compliance monitoring tool (Section 6.4.2). Amendment 19 authorizes the Council to expand VMS coverage to fishery sectors that may be subject to groundfish habitat protection closures. The Council's final recommendations on both Amendments 18 and 19 are scheduled for their November 2005 meeting.

At its November 2002 meeting, the Council recommended that NMFS, in consultation with the ad hoc VMS Committee, prepare a rule to implement a pilot VMS program for monitoring compliance with large-scale depth-based management areas. The Council's preferred alternative was for a pilot program that required all vessels registered to Pacific Coast groundfish fishery LE permits to carry and use a basic VMS

system (a system capable of one-way communications) and to provide declaration reports prior to fishing in specific depth-based management areas with gears that would otherwise be prohibited for groundfish fishing. Based on the Council's recommendation, NMFS prepared a proposed rule for a VMS program that was published on May 22, 2003 (68 FR 27972). The proposed rule was followed by a final rule that was published on November 4, 2003 (68 FR 62374). In addition, the rule required any vessel registered to a LE permit and any other commercial or tribal vessel using trawl gear, (including non-groundfish trawl gear used to take pink shrimp, spot and ridgeback prawns, California halibut and sea cucumber) to declare their intent to fish within a gear specific conservation area in a manner consistent with conservation area requirements (I.E. Fishing in a trawl RCA for pink shrimp with a finfish excluder or for Pacific whiting with mid-water trawl gear during the primary season)

1.3 Purpose and need for action

Large-scale depth-based management areas, referred to as GCAs, are used to prohibit or restrict commercial and recreational groundfish fishing. The boundaries used to define the GCAs can be complex, involving hundreds of points of latitude and longitude. The Rockfish Conservation Areas (RCAs) are a sub-group of the GCAs that were specifically designed to protect overfished rockfish species in times and locations where they are believed to be most abundant. RCAs are defined by points of latitude and longitude that approximate fathom curves for depth ranges where overfished rockfish species are commonly found. Each RCA is gear specific. Groundfish fishing (either directed or incidental) with a gear that is likely to catch a particular overfished species is restricted or prohibited in areas where those species are most vulnerable. The RCAs are vast, cover much of the continental shelf, and extend along the entire West Coast from Canada to Mexico.

Deep-water fisheries on the slope and nearshore fisheries have been permitted in areas seaward or shoreward of the RCAs. Vessels intending to fish in the deep-water slope fisheries seaward of the westernmost boundary of an RCA are allowed to transit through the areas, providing their gear is properly stowed. Target fisheries with relatively low catch rates of overfished species, such as midwater trawling for pelagic species, and shrimp trawling with finfish excluders, have been allowed to occur in the RCAs. Various state-managed fisheries where groundfish are incidentally taken also occur in the RCA.

To ensure the integrity of the RCAs and other conservation areas, a pilot VMS program was implemented on January 1, 2004. The pilot program requires vessels registered to Pacific Coast groundfish fishery LE permits to carry and use VMS transceiver units while fishing off the coasts of Washington, Oregon and California. Traditional enforcement methods (such as aerial surveillance, boarding at sea via patrol boats, landing inspections and documentary investigation) are especially difficult to use when the closed areas are large-scale and the lines defining the areas are irregular. Furthermore, when management measures allow some gear types and target fishing in all or a portion of the conservation area, while other fishing activities are prohibited, it is difficult and costly to effectively enforce closures using traditional methods. Scarce state and federal resources also limit the extent to which traditional enforcement methods can be used effectively.

Expanding coverage of the current VMS monitoring program to the OA fisheries will enhance state and federal enforcement's ability to monitor vessel compliance with depth-based conservation areas. Depth-based management areas were established so that healthy fisheries could continue in areas and with gears where little incidental catch of overfished species occurs. Therefore, maintaining the integrity of conservation areas is consistent with the conservation goals and objectives of the Pacific Coast Groundfish FMP. The purpose of this EA is to analyze a reasonable range of VMS program coverage levels for vessels that fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery.

1.4 Scoping Process

The scoping process, where stakeholder input on the issue is provided, aids in determining the range of issues that the NEPA document (in this case the EA) needs to address. Scoping is intended to ensure that problems are identified early and properly reviewed, that issues of little significance do not consume time and effort, and that the draft NEPA document is thorough and balanced. The scoping process should: identify the public and agency concerns; clearly define the environmental issues and alternatives to be examined, including the elimination of nonsignificant issues; identify related issues, and; identify state and local agency requirements that must be addressed. An effective scoping process can help reduce unnecessary paperwork and time delays in preparing and processing the NEPA document. This EA tiers off the original VMS EA, titled "The Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery," and therefore presents scoping activities that have occurred since September 2003.

In October 2003, the ad hoc VMS Committee, which is comprised of state, federal and industry representatives, held a public meeting to consider expanding the VMS program beyond the LE fisheries. During this meeting, the committee discussed criteria that would be used to prioritize the expansion of the VMS program. These criteria included: the impacts on overfished species if illegal groundfish fishing occurred in a GCA the ability of enforcement to identify fishery participants that are targeting groundfish; and the ability of enforcement to distinguish between LE vessels and other fishing vessels that look like LE vessels. The committee determined that commercial vessels operating in the EEZ at any time during the year and that land groundfish should be considered for the next phase of the VMS program. The ad hoc VMS Committee also recommended priorities for expanding VMS coverage to the different OA gear groups. Longline was given the highest priority, followed by groundfish pot, non-groundfish trawl (excluding pink shrimp), and line (excluding salmon). The committee considered expansion to the charter and private sectors of the recreational fishery, but determined that an area-by-area evaluation of the groundfish impacts by these participants was necessary before a final committee recommendation could be made.

At the Council's November 2003 meeting, the ad hoc VMS Committee presented its report to the Council: (Exhibit D. 10b, Supplemental Attachment 2, November 2003). Following public testimony and consideration of the committee report, the Council indicated that further information on the success of the pilot phase of the program was needed before they would consider expansion into other fisheries. VMS reports were provided to the Council by OLE at its subsequent meetings.

At the Council's September 2004 meeting, NMFS presented a draft EA that contained a range of five VMS coverage alternatives for the OA fishery. These alternatives were based on the ad hoc VMS committee's October 2003 recommendation to the Council. The Council reviewed the alternatives, considered the input of its advisory bodies, and listened to public testimony, before adopting a revised range of eight alternatives for further analysis. The Council also recommended an October 1, 2005 implementation date for the expanded VMS program. To allow time for the affected public to review the alternatives, the Council delayed action on expanding the VMS program until its April 2005 Council meeting in Tacoma, Washington.

In October 2004, the ad hoc VMS Committee held a public meeting in Portland, Oregon, where the alternatives recommended by the Council were reviewed. At this same meeting, the ad hoc VMS Committee asked that a variation of one of the Council recommended alternatives be included in the analysis.

Between January 10, 2005 and March 5, 2005, NMFS held eight public meetings in coastal communities to provide the interested public with information regarding the current VMS systems, the expansion of the VMS program into the OA groundfish fisheries, and to provide information about how and when to provide comments to NMFS and the Council. These meetings occurred in the following communities with relatively high OA groundfish landings: Westport, WA; Astoria, OR; Newport, OR; Port Orford, OR; Fort Bragg, CA; Morrow Bay, CA; San Francisco, CA; and Los Alamitos, CA.

At the Council's April 2005 meeting, NMFS presented a revised draft EA that analyzed the nine VMS coverage alternatives for the OA fishery. The Council reviewed the alternatives, considered input from its advisory bodies, and listened to public testimony, before recommending that further analysis be conducted and brought back to the Council at its September 2005 meeting.

At the Council's June 2005 meeting, it adopted a preferred alternative for the "essential Fish Habitat Designation and Minimization of Adverse Impacts Draft Environmental Impact Statement (EIS)." The Council's preferred alternative included a recommendation that this EA be expanded to include an alternative that would require the used of VMS on all groundfish bottom trawl vessels. Background information and supporting documentation for that recommendation is found withing that EIS.

In September 2005, the ad hoc VMS Committee held a public meeting in Portland, Oregon, where the thirteen alternatives recommended for analysis were reviewed.

1.5 Other NEPA documents this EA relies on

This is a tiered EA that expands on information presented in the July 2003 EA, titled The Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery. This EA expands on the VMS program presented in the original VMS EA by considering alternative coverage levels for the OA fisheries.

This EA relies on three EIS documents that have been prepared for the groundfish fishery since November 2003. Two of the EIS documents pertain to the harvest specifications and management measures and are titled: 1) Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for 2004, and 2) Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for 2005-2006. The third EIS, which was available as a draft EIS in February 2005, concerns Essential Fish Habitat (EFH) and is titled: The Pacific Coast Groundfish Fishery Management Plan, EFH Designation and Minimization of Adverse Impacts. These three EISs have detailed descriptions of the affected environment, including: the geographical location in which the groundfish fisheries occur; various species that groundfish vessels harvest and interact with; the fish buyers and processors that are dependent on the fishery; the suppliers and services; and, ultimately the fishing-dependent communities where vessels dock and fishing families live who are dependent on these fisheries. Relevant information on the environment was summarized from these EISs for this document. In the sections where this information was summarized, readers who are interested in more detailed descriptions are encouraged to read these earlier NEPA documents.

2.0 ALTERNATIVE MANAGEMENT ACTIONS

2.1 Alternatives Previously Considered for Monitoring Time Area Closures

The July 2003 VMS EA ("A Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery") was prepared prior to implementing the pilot VMS program in the LE fisheries. The original VMS EA examined three primary issues relevant to the development of a program for monitoring the time-area closures: 1) the monitoring system, 2) appropriate coverage levels, and 3) the payment structure. The Council considered the alternative management actions for each of these issues before making recommendations to NMFS.

The monitoring system alternatives considered by the Council included: 1) declaration reports; 2) a basic VMS system with 1-way communications and declaration reports; 3) an upgraded VMS system with 2-way communications and declaration reports; and 4) fishery observers (one per vessel) with declaration reports. Declaration reports allow vessels to declare their intent to fish within a GCA specific to their gear type, providing the activity is consistent with the GCA restrictions. The primary difference between the two VMS alternatives was that the upgraded two-way system could allow messages to be sent to and from the vessels, including fully compressed data messages. The basic 1-way VMS system primarily transmits positions to a shore station.

At its November 2002 meeting, the Council recommended that NMFS move forward with a rulemaking to require a basic VMS system and declaration reports. The Council indicated that it considered a basic VMS system to be adequate for maintaining the integrity of the closed areas. A basic VMS system is more costly than declaration reports, but less costly than either the upgraded VMS system or observers.

The coverage alternatives considered by the Council defined sectors of the commercial and recreational groundfish fleets that would be required to carry the recommended monitoring system (either VMS or an observer). The coverage alternatives included: 1) all vessels registered to LE permits; 2) all LE vessels that fish in the EEZ at any time during the year; 3) all active LE, OA, and recreational charter vessels that fish in conservation areas; and 4) all LE, OA, and recreational charter vessels regardless of where fishing occurs. The Council recommended that vessels registered to LE permits fishing in the EEZ off the Washington, Oregon, and California coasts be required to have and use VMS transceiver units whenever they fish. In addition, the Council recommended declaration reporting requirements for any vessel registered to a LE permit, and any commercial or tribal vessel using trawl gear, including non-groundfish trawl gear used to take pink shrimp, spot and ridgeback prawns, California halibut, and sea cucumber. This level of VMS coverage would allow enforcement to effectively monitor LE trawl vessels for unlawful incursions into RCAs while allowing legal incursions, such as midwater trawling, for Pacific whiting, yellowtail and widow rockfish and non-groundfish target fisheries, to occur. A notable number of LE vessels also participate in non-groundfish fisheries, such as shrimp and prawn trawl fisheries, troll albacore and troll salmon fisheries, and the pot fisheries for crab. These fisheries would continue to be allowed to occur in the RCAs. However, vessels registered to LE permits would be required to have an operable VMS unit on board whenever the vessel was fishing in state or federal waters off the states of Washington, Oregon or California. This level of coverage was intended to be a pilot program that began with the sector of the fishery that is allocated the majority of the commercial groundfish resources.

The payment structure alternatives considered by the Council defined the cost responsibilities for purchasing, installing, and maintaining the VMS transceiver units, as well as the responsibilities for transmitting reports and data. The payment structure alternatives included: 1) the vessel pays all costs associated with purchasing, installing and maintaining the VMS transceiver unit, as well as the costs associated with the transmission of reports and data; 2) the vessel pays only for the VMS transceiver and NMFS pays all other costs; 3) NMFS pays for the initial transceiver, but all other associated expenses including installation, maintenance and replacement would be paid for by the vessel; and 4) NMFS pays for everything related to VMS. Although the Council recommended that NMFS fully fund a VMS monitoring program, to date, it has not been possible because neither state nor federal funding is available

for purchasing, installing, or maintaining VMS transceiver units, nor is funding available for data transmission. Because of the critical need to monitor the integrity of conservation areas that protect overfished stocks while allowing for the harvest of healthy stocks, NMFS moved forward with the rulemaking. Should funds become available in the future, NMFS is not precluded from reimbursing participants for all or a portion of the costs associated with the VMS monitoring program.

2.2 Alternatives being considered

As stated in the previous section, this EA tiers off of the original VMS EA, titled "The Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery." The intent of the EA is to analyze expanding the coverage of the initial VMS monitoring program to the OA fisheries to promote compliance with regulations that prohibit or restrict fishing activities in the RCAs and GCAs. Therefore, a range of VMS program coverage levels for vessels fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery is defined and analyzed in this document.

The monitoring mechanism and payment structure that was implemented through the final rule published on November 4, 2003 (68 FR 62374) will not be affected by the proposed action. However, it must be noted that moving this rulemaking forward at this time will require OA fishery participants to bear the cost of purchasing, installing, and maintaining VMS transceiver units, VMS data transmissions, and reporting costs associated with declaration requirements. Neither state nor federal funding are available at this time. If money becomes available in the future, fishery participants may be reimbursed for all or a portion of their VMS expenses.

Open access coverage alternatives

At the Council's September 2004 meeting, NMFS presented a draft EA that contained a range of five VMS coverage alternatives for the OA fishery. These alternatives were based on the ad hoc VMS Committee's October 2003 recommendation to the Council. The coverage levels identified in Alternatives 2-4A and 5A are based on different combinations of the OA gear groups. In order of priority, the VMS ad hoc committee identified the need for VMS coverage for the following OA gear groups: longline, groundfish pot, trawl (excluding shrimp), and line (excluding salmon). Alternative 2 requires all vessels using longline gear to have and use a VMS transceiver. Each of the following Alternatives 3, 4 and 5A build on the previous alternative by adding the next OA gear group in order of priority. Each of these alternatives is described in detail below.

The Council reviewed the five alternatives (Alternatives 1-4A and 5A,) considered input from its advisory bodies, and listened to public testimony, before recommending a range of eight alternatives (Alternatives 1-4A, 5A, 5B, 6A & 7) for further analysis. The Council also recommended an October 1, 2005 implementation date for the expanded VMS program. Alternative 5B is based on the Enforcement Consultants recommendations to the Council. This alternative is the same as 5A except that it excludes vessels in fisheries where incidental catch of overfished species was considered to be very low, however it includes salmon troll vessels. Alternative 6A, though modified by the Council, was based on the Groundfish Advisory Panel's (GAP) majority view. Under Alternative 6A, VMS would be required on any commercial fishing vessel for which an RCA restriction applied. This alternative was viewed by the GAP as a simple and straightforward way to maintain the integrity of the RCAs. Alternative 7, is the GAP minority alternative, and is basically the same as Alternative 6A, except that vessels under 12 feet (ft) in length are excluded. Though this alternative specifically excluded vessels that fish only in state waters, those vessels are already excluded because there is no link to federal authority at this time (federal nexus). Each of these alternatives is described in detail below.

In October 2004, the ad hoc VMS Committee met and reviewed the alternatives that the Council recommended for further analysis. At this same meeting, a variation of Alternative 6A was recommended by the ad hoc VMS Committee. Alternative 6B is the alternative that the ad hoc VMS Committee requested to be added to the EA for analysis. Alternative 6B is the same as Alternative 6A, except that only salmon troll vessels north of 40 °10 N. lat. that fish pursuant to the harvest guidelines, quotas, and

other management measures governing the OA fishery for groundfish species other than yellowtail rockfish would be required to carry and use a VMS transceiver and provide declaration reports. These alternatives are described in detail below.

At the Council's April 2005 meeting, NMFS presented a revised draft EA that analyzed the nine VMS coverage alternatives for the OA fishery. The Council reviewed the alternatives, considered input from its advisory bodies, and listened to public testimony, before recommending that further analysis be conducted and brought back to the Council at its September 2005 meeting. The Council specifically asked that NMFS conduct further analysis to examine thresholds for identifying vessels that land insignificant amounts of groundfish and low impact fisheries that could be considered as exceptions to the VMS requirement. In addition, concerns about of the cost of a VMS system being borne by industry necessary to maintain the integrity of the RCA management regime for the OA fisheries were expressed by the Council. As a result of Council discussion at the April 2005 meeting, NMFS developed three additional alternatives and broadened the analysis. The three new alternatives, identified as Alternatives 8-10, and are described in detail below.

At the Council's June 2005 meeting, measures to protect groundfish EFH, as mandated by the Magnuson-Stevens Act, were considered. Though the habitat protection measure have been developed as a separate action from the VMS program, monitoring measures such as VMS were considered as a tool for monitoring incursions into the many new habitat protection areas. These areas are utilized by a wide variety of species, including overfished rockfish species. As part of the habitat protection measures, the Council requested that VMS requirements for pink shrimp trawlers operating in the OA sector (those pink shrimp trawl vessels that are registered to LE permits are already required to have VMS) be included in the OA VMS analysis. Therefore, Alternative 4 has been divided into Alternatives 4A (previously Alternative 4) and 4B, with the difference being the inclusion of all pink shrimp trawl vessels under Alternative 4B. The Council may choose to include pink shrimp trawl vessels with any one the alternatives when it makes its final recommendations. At its June 2005 meeting, the Council also decided to move its final decision on this action from September 2005 to November 2005.

Table 2.0.1 summarizes the alternative management actions for expanding coverage of the current VMS program into the OA fisheries. The first column of Table 2.0.1 presents a brief description of each alternatives being considered in this EA. The center column uses the average number of vessels from each fishery (fisheries are target species and gear specific groupings) from 2000-2004 as an estimate of the number of vessels that could be added as a result of each alternative. The RCA restrictions vary by fishery, with some vessels being allowed to fish within the RCAs for their non groundfish target species. To aid the reader, the last column describes the basic RCA restrictions for each the open access fisheries.

Table 2.0.1: Summary of the Alternative Management Actions for Expanding Coverage of the Monitoring System for Time-Area Closures in the Pacific Coast Groundfish Fishery for the Open Access Fisheries

VMS coverage alternatives	Estimated number of vessels meeting the VMS requirements (average number of vessels per/yr 2000-2004) a/	RCA restrictions by gear & target species
Alternative 1 -- Status quo. Require declaration reports from OA non-groundfish trawl vessels that fish within a trawl RCA	Only declaration reports required from nongroundfish trawl vessels fishing in the trawl RCAs	Groundfish directed fisheries Longline, pot, line, and net gear - non-trawl gear RCA applies Incidental fisheries using longline gear Directed Pacific halibut - non-trawl RCA applies CA halibut - non-trawl gear RCA applies when vessel takes and retains, possesses or lands federally-managed groundfish HMS pelagic longline - currently prohibited gear in EEZ, not legal groundfish gear Incidental fisheries using pot gear Dungeness crab, prawn, & California sheephead - non-trawl RCA restrictions apply when vessel takes and retains, possesses or lands federally-managed groundfish Incidental fisheries using trawl gear Pink shrimp trawl gear - not subject to RCAs Ridgeback Prawn - non-groundfish trawl RCAs for ridgeback prawn specified for south of 38°57.50' N. lat. Sea cucumber and CA halibut - non-groundfish trawl RCAs for sea cucumber and CA halibut south of 40°10' N. lat. Incidental fisheries using line gear California halibut and HMS - RCA restrictions apply when vessel takes and retains, possesses or lands federally managed groundfish Salmon troll - south of 40°10', the non-trawl RCA restrictions apply when vessel takes and retains or possesses federally managed groundfish; north of 40°10' , the non-trawl RCA restrictions apply when vessel takes and retains or possesses federally-managed groundfish other than yellowtail rockfish Incidental fisheries using net gear California halibut and HMS - non-trawl RCA restrictions apply south of 40°10' N. lat. when vessel takes and retains, possesses or lands federally managed groundfish
Alternative 2 -- longline vessels. Require all vessels using longline gear in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to provide declaration reports and to activate and use a VMS transceiver.	Longline Groundfish directed - 282 longline vessels/yr Pacific halibut - 38 out of 65 vessels/yr landed groundfish CA halibut - 2 out of 9 vessels/yr landed groundfish HMS -pelagic longline gear currently prohibited in EEZ, not legal groundfish gear.	
Alternative 3 -- longline or pot vessels Require all vessels using longline or pot gear in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to provide declaration reports and to activate and use a VMS transceiver.	Longline - Same as Alt. 2 (322 vessels) Pot Groundfish directed - 145 pot gear vessels/yr Dungeness crab - 21 out of 801 vessels/yr landed groundfish Prawn - 6 out of 28 vessels/yr landed groundfish California sheephead (CA nearshore.) - 21 out of 68 vessels/yr landed groundfish	
Alternative 4A -- longline, pot, or trawl vessels, excluding pink shrimp trawl vessels. Require all vessels using longline, pot or trawl gear in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to provide declaration reports and to activate and use a VMS transceiver. Pink shrimp vessels are excluded.	Longline - Same as Alt. 2 (322 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Spot prawn - trawl gear prohibited California halibut - 40 vessels/yr Sea cucumber - 14 vessels/yr Ridgeback prawn - 23 vessels/yr	

Table 2.0.1: Continued

VMS coverage alternatives	Estimated number of vessels meeting the VMS requirements (average number of vessels per/yr 2000-2004) a/	RCA restrictions by gear & target species
Alternative 4B -- longline, pot, or trawl vessels. Require all vessels using longline, pot or trawl gear in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to provide declaration reports and to activate and use a VMS transceiver.	Longline - Same as Alt. 2 (322 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Same as Alt. 4A (77 vessels), except 54 pink shrimp vessels are included (131 vessels)	Same as identified for Alt. 1 - 4A
Alternative 5A -- longline, pot, trawl and line gear vessels, excluding pink shrimp trawl and salmon troll vessels. Require all vessels using longline, pot, trawl, or line gear in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to provide declaration reports and to activate and use a VMS transceiver. Vessels using pink shrimp trawl gear are excluded. Vessels using salmon troll gear are excluded.	Longline - Same as Alt. 2 (322 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Same as Alt. 4A (77 vessels) Line Groundfish directed - 590 line gear vessels/yr California halibut - 58 out of 239 vessels/yr landed groundfish HMS - 10 out of 200 vessels/yr landed groundfish	
Alternative 5B – (Enf. Consultants) longline, pot, trawl and line gear vessels; excluding pink shrimp trawl, HMS longline and line gear and Dungeness crab pot gear. Require all vessels using longline, pot, trawl, or line gear in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to provide declaration reports and to activate and use a VMS transceiver. Vessels using pink shrimp trawl gear are excluded. Vessels using gears where incidental catch of overfished species is projected to be minimal (HMS longline and line gear and Dungeness crab pot gear) are excluded.	Longline - Same as Alt. 2 (322 vessels) Pot - Same as Alt. 3, except 21 Dungeness crab vessels are excluded (172 vessels) Trawl - Same as Alt. 4A (77 vessels) Line - Same as Alt.5A, except 10 HMS line vessels are excluded, and 234 salmon troll vessels are included - (882 vessels)	

NOTE: Alternatives 6A-10 were developed as a result of the Council's recommendations at its April 2005 meeting following consideration of the draft VMS EA. Alternative 4B was developed following the Council's June meeting after consideration of VMS for monitoring trawl activities in relation to closed area that protect groundfish habitat. The Council may choose to include trawl with any one the following alternatives when it makes its final recommendations.

Table 2.0.1: Continued

VMS coverage alternatives	Estimated number of vessels meeting the VMS requirements (average number of vessels per/yr 2000-2004) a/	RCA restrictions by gear & target species
Alternative 6A – (GAP Majority with Council modifications) Any vessel engaged in commercial fishing to which a RCA restriction applies. Require all vessels engaged in a commercial fishery to which an RCA restriction applies to carry and use VMS transceivers. Vessels using salmon, Dungeness crab, CPS or HMS gear that do not take and retain groundfish are excluded. Pink shrimp vessels are excluded.	Longline - Same as Alt. 2, except that all 65 Pacific halibut vessels, vessels/yr are included (349 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Same as Alt. 4A (77 vessels) Line - Same as Alt.5A, except 234 salmon troll vessels are included - (892 vessels) Net CPS gear not legal groundfish gear HMS south -25 out of 143 vessels/yr landed groundfish CA halibut 47 vessels/yr out of 62 landed groundfish	Same as identified for Alt. 1-4
Alternative 6B – (VMS committee) Any vessel engaged in commercial fishing to which a RCA restriction applies, except salmon troll vessels north of 40°10' N. lat. that only retain yellowtail rockfish. Require all vessels engaged in a commercial fishery to which an RCA restriction applies to carry and use VMS transceivers. Vessels using salmon, Dungeness crab, CPS or HMS gear that do not take and retain groundfish are excluded. Salmon troll vessels operating in waters north of 40°10' N. lat. that only retain yellowtail rockfish are excluded. Pink shrimp vessels are excluded. If an RCA requirement is discontinued during the year, mandatory VMS coverage would be discontinued for the affected vessels.	Longline - Same as Alt. 6A (349 vessels/yr) Pot - Same as Alt. 3 (193 vessels/yr) Trawl - Same as Alt. 4 (77 vessels/yr) Line - Same as Alt.6A, except 58 salmon troll vessels/yr operating in waters north of 40°10' N. lat. that retain only yellowtail rockfish are excluded (834 vessels/yr) Net - Same as Alt. 6A	
Alternative 7 – (GAP minority with Council modifications) Any vessel engaged in commercial fishing to which a RCA restriction applies, except vessels less than 12 feet in length. Require all vessels ≥12 ft in length that fish in federal waters for which there is an RCA requirement to carry and use VMS transceivers and to provide declaration reports. Vessels using salmon, Dungeness crab, CPS, or HMS gear that do not take and retain groundfish are excluded. Pink shrimp vessels are excluded. Vessels that fish exclusively in state waters are excluded.	Longline - Same as Alt. 6A except 6 vessels/yr <12' are excluded (343 vessels/yr) Pot - Same as Alt. 3 except 2 vessels/yr <12'are excluded (191 vessels/yr) Trawl - Same as Alt. 4 (77 vessels/yr) Line -Same as Alt.6A, except 14 vessels/yr <12' are excluded (878 vessels/yr) Net - Same as Alt. 6A	

Table 2.0.1: Continued

VMS coverage alternatives	Estimated number of vessels meeting the VMS requirements (average number of vessels per/yr 2000-2004) a/	RCA restrictions by gear & target species
Alternative 8 - **Low impact OA fisheries exempt.** Require all vessels that fish in federal waters for which there is an RCA requirement, to carry and use VMS transceivers and to provide declaration reports except that vessels where the incidental catch of overfished species is projected to be minimal. The following vessels are excluded from the VMS requirement: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, HMS net, California sheephead pot gear and pink shrimp vessels.	Longline - 282 groundfish directed vessels/yr, 65 Pacific halibut vessels/yr (349 vessels/yr) Pot - 145 groundfish directed vessels/yr Trawl -40 CA halibut vessels/yr Line - 590 groundfish directed vessels/yr, 234 salmon troll vessels/yr, and 58 CA halibut vessels/yr (882 vessels/yr) Net - CA halibut 47 vessels/yr out of 62 landed groundfish	Same as identified for Alt 1 - 4A
Alternative 9 - Directed OA fisheries (includes all vessels landing more than a minimal amount of groundfish) - Require all vessels that fish in federal waters for which there is an RCA requirement, to carry and use VMS transceivers and to provide declaration reports if they land more than 500 lb of groundfish in a any calendar year. **NOTE**: If this alternative were defined as - "Require all vessels that fish in federal waters for which there is an RCA requirement, to carry and use VMS transceivers and to provide declaration reports if the sum of all groundfish in any landing exceeded 50% of the revenue on a fish ticket" -- it would include the following vessels: 282 groundfish directed longline vessels/yr, 142 groundfish directed pot gear vessels/yr, 590 groundfish directed vessels/yr	Longline - 282 groundfish directed longline vessels/yr, and 7 Pacific halibut vessels/yr -14 vessels/yr if only 2003 & 2004 data used (291 vessels/yr) HMS - longline gear prohibited in EEZ Pot - 145 groundfish directed pot gear vessels/yr, 1 Dungeness crab vessel/yr, 2 prawn vessels/yr, and 2 California sheephead (150 vessels/yr) Trawl - 9 CA halibut vessels/yr, 3 pink shrimp vessel/yr Line - 590 groundfish directed vessels/yr, no CA halibut vessels, 1 HMS vessel/yr, and 6 salmon troll vessels/yr (597 vessels/yr) Net - 15 CA halibut vessels/yr	
Alternative 10 - No Action Alternative No VMS requirements for vessels in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery. Discontinue use of RCA management and adjust trip limits and seasons accordingly. Require declaration reports from OA non-groundfish trawl vessels that fish within a trawl RCA	OA vessels would not be required to have VMS Declaration reports required from nongroundfish trawl vessels fishing in the trawl RCAs	No RCA restrictions

a/ The projected number vessels represents those that operated in both state and/or federal waters. The data does not allow vessels that only fished in federal waters to be identified.

Alternative 1: Status quo. Do not specify mandatory VMS program coverage requirements for vessels used to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery.

Discussion: Vessels without LE permits that fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery would not be required to carry and use VMS transceiver units. However, vessels could elect to voluntarily carry a VMS transceiver unit and provide position reports to NMFS if they choose. Vessels registered to LE permits that operate in both LE and OA fisheries (fishing conducted with OA gear, by a vessel that has a valid LE permit with an endorsement for another type of gear) would continue to be required to carry and use a VMS transceiver and to provide declaration reports. Declaration reports would continue to be required from vessels using non-groundfish trawl gear whether or not groundfish are retained by the vessel.

Unlike Alternative 10, the no action alternative, Alternative 1 would allow for the continued use of the RCAs management for OA groundfish fisheries without a dedicated mechanism for monitoring compliance with depth-based conservation areas. Traditional enforcement methods (such as aerial surveillance, boarding at sea via patrol boats, landing inspections and documentary investigation) would be the primary means to monitor vessel compliance with the RCA restrictions. Scarce state and federal resources necessary to maintain the use of traditional enforcement methods will continue to be stretched to include monitoring OA vessel compliance with depth-based conservation areas.

Alternative 2: longline vessels. Require all vessels using longline gear that fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to carry and use VMS transceiver units and provide declaration reports. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) for the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel was used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would be expanded to include these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: Between 2000 and 2004, an average of 282 vessels per year used longline gear for directed harvest of groundfish. These vessels targeted species such as sablefish, lingcod, and rockfish. For the purpose of this analysis, directed vessels were assumed to be those longline vessels where the sum of all groundfish in any landing exceeded 50% of the revenue on a fish ticket**.** The average annual exvessel revenue from groundfish for OA vessels that used longline gear for directed harvest of groundfish between 2000 and 2004 was $5,726 per vessel. Between 2000 and 2004, an average of 2 out of 9 vessels per year landed OA groundfish while using longline gear to target California halibut. The average annual revenue from groundfish taken with longline gear for each of these vessels was $20. An average of 38 out of 65 directed Pacific halibut vessels not registered to LE permits that fished south of Point Chehalis, WA and landed groundfish annually between 2000 and 2004, with an average annual value of $399. Longline gear (pelagic longline) is no longer allowed in federal waters off the West Coast by vessels harvesting Highly Migratory Species (HMS) species, nor is it legal groundfish gear.

Overfished species interactions for all OA directed groundfish gears were projected to include bocaccio, canary rockfish, cowcod, darkblotched rockfish, lingcod, POP and yelloweye rockfish (Table 3.3.3.5). However, gear specific overfished species catch projections were not available for the directed OA longline vessels. Canary rockfish and the other overfished shelf rockfish species are easily targeted using line gears. Because important target species (i.e. sablefish, dogfish) for OA longline vessels are also found seasonally on the shelf, if fishing were to occur within the nontrawl RCAs, they would likely encounter overfished shelf rockfish and incur an unacceptably high incidental mortality. California halibut fishery is most likely to interact with bocaccio, canary rockfish and lingcod. Groundfish are caught in the Pacific halibut fishery coastwide. Rockfish and sablefish are commonly intercepted, as they are found in similar habitat to Pacific halibut and are easily caught with longline gear. There is a strong correlation between directed line fisheries that target Pacific halibut (both commercial and recreational) and bycatch of yelloweye rockfish. In 2003, the Council used the depth-based results of the International Pacific Halibut Commission (IPHC) halibut survey data to estimate the impacts of the Pacific halibut fishery on yelloweye rockfish. Approximately 99.1% of the yelloweye rockfish catch and 7.7% of the commercial-sized Pacific halibut catch in the IPHC survey occurred in waters shallower than 100 fm. Therefore, the Council

recommended restricting the commercial halibut fishery to waters deeper than 100 fm. No overfished species catch was projected for the HMS longline fishery for 2005 because it is currently a prohibited gear.

Vessels would be required to operate their VMS units continuously from the point at which a vessel leaves port on a trip in which the vessel uses longline gear to fish in the OA fishery in federal waters. The use of the term "fish" or "fishing" includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters (50 CFR 600.10). Under this alternative, data would be available to monitor vessels using longline gear in the OA fisheries for unlawful incursions into conservation areas. Once the requirement is triggered, vessels must continue to operate the VMS units for the remainder of the calendar year; therefore, position data would be available for the vessels when they participate in other state and federal fisheries. Because of the mobility of vessels within the OA fleet to fish with alternative OA gears, some vessels, particularly directed vessels or those in fisheries where alternative gears are allowed, may change gear (I.E. a change from longline to pot or vertical line gear) to avoid the VMS requirements.

Alternative 3: longline or pot vessels. In addition to those vessels identified under Alternative 2, require all vessels using pot gear that fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery to carry and use VMS transceiver units and provide declaration reports. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would be expanded to include these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are in addition to those vessels identified under Alternative 2. Between 2000 and 2004, an average of 142 vessels per year used pot gear for directed harvest of groundfish in federal waters. For the purpose of this analysis, directed vessels were assumed to be those pot vessels where the sum of all groundfish in any landing exceeded 50% of the revenue on a fish ticket**.** The average annual exvessel revenue from groundfish for these vessels for the 2000-2004 period was $6,829 per vessel. Fisheries where pot gear is used and incidentally caught groundfish are landed include Dungeness crab, prawn, and California sheephead (currently part of the California nearshore species management group) fisheries. On average between 2000 and 2004, 21 out of 801 vessels landed OA groundfish while using pot gear to fish for Dungeness crab. The average annual exvessel revenue from groundfish landed by Dungeness crab vessels during the 2000-2004 period was $61 per vessel. On average between 2000 and 2004, 6 out of 28 vessels landed OA groundfish while using pot gear to fish for prawns. The average annual exvessel revenue from groundfish for prawn vessels during the 2000-2004 period was $949 per vessel. On average between 2000 and 2004, 21 out of 68 vessels per year landed OA groundfish taken in pot gear by vessels also fishing for California sheephead. The average annual exvessel revenue from groundfish for California sheephead vessels in the 2000-2004 period was $640 per vessel.

The overfished species interactions under this alternative are in addition to those identified under Alternative 2. Overfished species interactions in the directed groundfish fisheries are projected to include bocaccio, canary rockfish, cowcod, darkblotched rockfish, lingcod, POP and yelloweye rockfish (Table 3.3.3.5). Gear specific overfished species catch projections were not available for directed OA pot gear. Pots or traps are used in the incidental OA fisheries that target Dungeness crab, prawns, and California sheephead. Pots can be designed to be selective in the pursuit of various species. They can be rigged to be size selective, and in some cases, species selective. Fish pots can also be size selective through various means including mesh size, circular escape rings or rectangular escape vents. There is a low mortality for bycatch of unwanted species and juvenile fish in a pot fishery. Bycatch species are generally kept alive in the pot until it is hauled and then can be released alive. Despite the selectivity of pot gear, small amounts of overfished species are taken incidentally. Prior to RCA management, small amounts of lingcod and canary rockfish were landed in the Dungeness crab pot fishery, while small amounts of lingcod, darkblotched rockfish, bocaccio, canary rockfish, cowcod, widow rockfish and yelloweye rockfish were landed in the prawn fisheries (Table 3.3.3.6 and 3.3.3.7). Prior to RCA management small amounts of lingcod, bocaccio, and cowcod were landed by vessels targeting California sheephead.

Vessels would be required to operate their VMS units continuously from the point at which the vessel

leaves port on a trip in which longline or pot gear is used to fish in the OA fishery in federal waters. The use of the term "fish" or "fishing" includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters (50 CFR 600.10). Under this alternative, data would be available to monitor vessels using longline or pot gear in the OA fisheries for unlawful incursions into conservation areas. Once the requirement is triggered, vessels must continue to operate the VMS units for the remainder of the calendar year. Consequently, position data would be available for the vessels when they participate in other state and federal fisheries. Because of the mobility of vessels within the fleet to fish with alternative OA gears, some vessels, particularly directed vessels or those in fisheries where alternative gears are allowed, may change gear (I.E. a change from longline or pot gear to vertical line gear) to avoid the VMS requirements.

Alternative 4A: longline, pot, or non-groundfish trawl vessels, excluding pink shrimp trawl vessels. In addition to those vessels identified under Alternatives 2 and 3, require all vessels that use non-groundfish trawl gear to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery, excluding pink shrimp vessels, to carry and use VMS transceiver units and to provide declaration reports. Prior to leaving port on a trip in which a vessel identified under this alternative takes and retains, possesses, or lands federally managed groundfish in federal waters with longline or pot gear; or uses non-groundfish trawl gear for prawns, sea cucumber or California halibut, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would be extended to cover these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are in addition to those vessels identified under Alternatives 2 and 3. This alternative adds the requirement for all non-groundfish trawl vessels that fish in federal waters, except those fishing for pink shrimp, to carry and use VMS transceiver units and to provide declaration reports. All vessels using non-groundfish trawl gear for sea cucumber, California halibut, and ridgeback (golden) prawns, would be included under this alternative, whether or not groundfish was retained.

On average between 2000 and 2004, 2 out of 14 vessels landed OA groundfish while using trawl gear to fish for sea cucumbers. The average annual exvessel revenue from groundfish landed by sea cucumber vessels during the 2000-2004 period was negligible. On average, between 2000 and 2004, 23 out of 40 vessels landed OA groundfish while using trawl gear to fish for California halibut. The average annual exvessel revenue from groundfish landed by California halibut vessels during the 2000-2004 period was $773 per vessel. On average between 2000 and 2004, 13 out of 23 vessels landed OA groundfish while using trawl gear to fish for ridgeback prawns. The average annual exvessel revenue from groundfish landed by ridgeback prawn vessels during the 2000-2004 period was $228 per vessel.

On average between 2000 and 2003, 7 out of 20 vessels landed OA groundfish while using trawl gear to fish for spot prawns. The average annual exvessel revenue from groundfish landed by ridgeback prawn vessels during the 2000-2003 period was $81 per vessel. After 2002, Washington State prohibited the use of trawl nets for harvesting spot prawns. On February 18, 2003, the California Fish and Game Commission adopted regulations prohibiting the use of trawl nets to take spot prawn. The regulations went into effect on April 1, 2003. After 2003, Oregon prohibited the use of trawl nets for harvesting spot prawns. Between 2000 and 2004, no trawl (beam trawl) vessels fishing for bait shrimp landed OA groundfish.

The overfished species interactions under this alternative are in addition to those identified under Alternative 2 and 3. The non-groundfish trawl fisheries primarily operate in nearshore and shelf areas. Ridgeback prawn trawls that operate south of Point Conception are required to used of finfish excluders or bycatch reduction devices (BRDs) to reduce the catch of finfish. In 1998, prior to implementation of the RCAs and the requirement to used BRDs, lingcod, bocaccio, cowcod, and widow rockfish were landed in the prawn fisheries (Amendment 16-3 EIS, July 2004). For nongroundfish trawl vessels where the primary target species was sea cucumber, no overfished species catch was projected for 2005. In 1998, prior to the implementation of RCAs, no overfished species catch was estimated to have been landed by sea cucumber vessels (Amendment 16-3 EIS, July 2004). Gear specific estimates for the nongroundfish trawl vessels where the primary target species was California halibut were not available for 2005; however small amounts of bocaccio (0.1 mt), canary rockfish (0.1 mt) and lingcod (2.0 mt) were projected to be taken by

all California halibut gears combined. In 1998, prior to the implementation of RCAs, small amounts of bocaccio, yelloweye rockfish and lingcod were landed by vessels where the primary target species was California halibut (Amendment 16-3 EIS, July 2004).

Vessels using longline or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term "fish" or "fishing" includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters (50 CFR 600.10). Under this alternative, data would be available to monitor vessels using longline, pot, or non-groundfish trawl gear (except for pink shrimp trawl) for unlawful incursions into conservation areas. Vessels must continue to operate the VMS units once the requirement is triggered; therefore, position data would be available for the vessels when they participate in other state and federal fisheries. Mobility of vessels within the fleet to fish with alternative OA gears to avoid the VMS requirements is similar to Alternative 3, because vessels using non-groundfish trawl gears are less likely to avoid the VMS requirements by using line gear.

Alternative 4B: longline, pot, or non-groundfish trawl vessels. In addition to those vessels identified under Alternatives 2 and 3, require all vessels that use non-groundfish trawl gear fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery, to carry and use VMS transceiver units and to provide declaration reports. Prior to leaving port on a trip in which a vessel identified under this alternative takes and retains, possesses, or lands federally managed groundfish in federal waters with longline or pot gear; or uses non-groundfish trawl gear for pink shrimp, prawns, sea cucumber or California halibut, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would be extended to cover these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are in addition to those vessels identified under Alternatives 2 and 3. This alternative adds the requirement for all non-groundfish trawl vessels that fish in federal waters to carry and use VMS transceiver units and to provide declaration reports. All vessels using non-groundfish trawl gear for sea cucumber, California halibut, ridgeback (golden) prawns, and pink shrimp would be included under this alternative whether or not groundfish was retained.

On average between 2000 and 2004, 2 out of 14 vessels landed OA groundfish while using trawl gear to fish for sea cucumbers. The average annual exvessel revenue from groundfish landed by sea cucumber vessels during the 2000-2004 period was negligible. On average, between 2000 and 2004, 23 out of 40 vessels landed OA groundfish while using trawl gear to fish for California halibut. The average annual exvessel revenue from groundfish landed by California halibut vessels during the 2000-2004 period was $773 per vessel. On average between 2000 and 2004, 13 out of 23 vessels landed OA groundfish while using trawl gear to fish for ridgeback prawns. The average annual exvessel revenue from groundfish landed by ridgeback prawn vessels during the 2000-2004 period was $228 per vessel.

On average between 2000 and 2003, 7 out of 20 vessels landed OA groundfish while using trawl gear to fish for spot prawns. The average annual exvessel revenue from groundfish landed by spot prawn vessels during the 2000-2003 period was $81 per vessel. After 2002, Washington State prohibited the use of trawl nets for harvesting spot prawns. On February 18, 2003, the California Fish and Game Commission adopted regulations prohibiting the use of trawl nets to take spot prawn. The regulations went into effect on April 1, 2003. After 2003, Oregon prohibited the use of trawl nets for harvesting spot prawns. Between 2000 and 2004, no trawl (beam trawl) vessels fishing for bait shrimp landed OA groundfish.

Although pink shrimp vessels are allowed to fish within the trawl RCA, providing a declaration report is sent prior to leaving port on a trip in which the vessel is used to fish within the RCA with shrimp trawl gear, they have been included under this alternative. State regulations require the use of approved finfish excluders by pink shrimp vessels. On average between 2000 and 2004, 33 out of 54 vessels landed OA groundfish while using trawl gear to fish for pink shrimp. The average annual exvessel revenue from groundfish landed by ridgeback prawn vessels during the 2000-2004 period was $1,474 per vessel. However, since the implementation of RCAs in 2003, the number of pink shrimp vessels landing groundfish has

substantially declined. In 2003, 6 out of 44 pink shrimp vessels landed OA groundfish with an exvessel revenue from $136 per vessel. While in 2004, 4 out of 43 pink shrimp vessels landed OA groundfish with an exvessel value of $19 per vessel.

The overfished species interactions under this alternative are in addition to those identified under Alternative 2 and 3. Pink shrimp vessels are allowed to fish within the trawl RCA providing a declaration report is sent prior to leaving port on a trip in which the vessel is used to fish within the RCA with shrimp trawl gear. In addition, state regulations require the use of approved finfish excluders by pink shrimp vessels. Finfish excluders have been required in pink shrimp trawls in California since September 2001 and since July 1, 2002 in Oregon and Washington.

The non-groundfish trawl fisheries primarily operate in nearshore and shelf areas. BRDs or Finfish Excluders in pink shrimp trawls are used to reduce mortality of overfished species in that fishery. Ridgeback prawn trawls that operate south of Point Conception are required to used BRDs to reduce the catch of finfish. Prior to implementation of the RCAs and the requirement to used BRDs, lingcod, darkblotched rockfish, bocaccio, canary rockfish, cowcod, widow rockfish and yelloweye were landed in the prawn (trap and trawl for all prawn species) fisheries (Table 3.3.3.6 and Table 3.3.3.7) south of 40˚10' N. latitude. For nongroundfish trawl vessels where the primary target species was sea cucumber, no overfished species catch was projected for 2005. Prior to the implementation of RCAs, less than 0.5 mt of all overfished species combined were landed by sea cucumber vessels in a given year (Table 3.3.3.6 and Table 3.3.3.7). Gear specific estimates for the nongroundfish trawl vessels that were the primary target species was California halibut were not available. Lingcod, bocaccio, canary rockfish and widow rockfish were historically landed by all California halibut gears combined (Table 3.3.3.6 and Table 3.3.3.7). The projections for 2005 are similar in composition (Table 3.3.3.5).

Vessels using longline or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term “fish” or “fishing” includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters (50 CFR 600.10). Under this alternative, data would be available to monitor vessels using longline, pot, or non-groundfish trawl gear for unlawful incursions into conservation areas. Vessels must continue to operate the VMS units once the requirement is triggered; therefore, position data would be available for the vessels when they participate in other state and federal fisheries. Mobility of vessels within the fleet to fish with alternative OA gears to avoid the VMS requirements is similar to Alternative 3, because vessels using non-groundfish trawl gears are less likely to avoid the VMS requirements by using line gear.

Alternative 5A: longline, pot, trawl and line gear vessels, excluding pink shrimp trawl and salmon troll vessels. In addition to those vessels identified under Alternatives 2-4A, require all vessels that use line gear (excluding salmon troll gear) to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery, to carry and use VMS transceiver units and provide declaration reports. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take, retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are in addition to those vessels identified under Alternative 2, 3 and 4A. Between 2000 and 2004, an average of 590 vessels per year used line gear to target groundfish in the OA fishery. For the purpose of this analysis, directed vessels were assumed to be those line vessels where the sum of all groundfish in any landing exceeded 50% of the revenue on a fish ticket**.** The average annual exvessel revenue from groundfish during this period was $4,235 per vessel. Other fisheries in which line gear is used and where incidentally caught groundfish are landed are the California halibut, HMS and salmon troll vessels. On average between 2000 and 2004, 58 out of 239 vessels landed OA groundfish while using OA line gear to fish for California halibut. The average annual exvessel revenue from groundfish landed by California halibut vessels during the 2000-2004 period was $105 per vessel. On average between 2000 and 2004, 10 out of 200 vessels landed OA groundfish while

using line gear to fish for HMS. The average annual exvessel revenue from groundfish landed by HMS vessels during the 2000-2004 period was $75 per vessel. The salmon troll fisheries are allowed to fish within the nontrawl RCA and are allowed to retain yellowtail rockfish north of 40°N. Lat. on trips where the vessel conducts fishing in the RCA. The ad hoc VMS Committee initially did not consider VMS to be an effective enforcement tool for monitoring OA trip limit compliance by salmon troll vessels, because VMS cannot be used to determine where a particular species was caught when a fishing trip occurs both inside and outside an RCA.

The overfished species interactions under this alternative are in addition to those that were identified under Alternative 2, 3 and 4A.. Overfished species interactions in the directed groundfish fisheries were projected to include bocaccio, canary rockfish, cowcod, darkblotched rockfish, lingcod, POP and yelloweye rockfish (Table 3.3.3.5). Gear specific overfished species catch projections were not available for the directed OA line gears. No gear specific overfished species catch projections or historical data were available for the California halibut trawl fishery. No overfished species catch was projected for the HMS line gear fisheries for 2005. Historical landings data show that only small amounts of lingcod, widow rockfish, and bocaccio have been landed in the HMS fisheries. (Table 3.3.3.6 and Table 3.3.3.7)

Vessels using longline or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term “fish” or “fishing” includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters. Under this alternative, data would be available to monitor, for unlawful incursions into conservation areas, vessels using longline, pot, non-groundfish trawl gear (except for pink shrimp trawl), and line gear (except salmon troll) in the OA fisheries. Vessels must continue to operate the VMS units once the requirement is triggered; therefore, position data would be available for the vessels when they participate in other state and federal fisheries.

Alternative 5B: longline, pot, trawl and line gear vessels; excluding pink shrimp trawl, HMS longline and line gear and Dungeness crab pot gear. In addition to those vessels identified under Alternatives 2-4A, require all vessels that use line gear (including salmon troll) to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery, to carry and use VMS transceiver units and provide declaration reports. Vessels using pink shrimp trawl gear are excluded under this alternative. In addition, vessels using HMS line gear, and Dungeness crab pot gear, where the incidental catch of overfished species is projected to be minimal, are excluded. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are the same vessels as those identified under Alternative 2, 3 and 4A, except that vessels using gears where the incidental catch of overfished species is projected to be minimal, are excluded. Vessels using pink shrimp trawl gear are excluded under this alternative. The legal groundfish gears with low incidental catch of overfished species are HMS line gear, and Dungeness crab pot gear. HMS longline gear is currently prohibited gear in the EEZ. Approximately 10 vessels per year between 2000 and 2004 landed groundfish taken with line gear while targeting HMS; and approximately 21 vessels per year between 2000 and 2004 landed groundfish taken with pot gear while targeting Dungeness crab. Under this alternative, vessels using salmon troll gear to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery would also be required to carry and use VMS transceivers and provide declaration reports. Between 2000 and 2004, an average of 234 out of 1,099 vessels per year landed groundfish taken with salmon troll gear. The annual exvessel revenue from groundfish taken by salmon troll vessels during this period was $73 per vessel.

For Alternative 5B, the overfished species interactions in the fisheries using longline gears were identified under Alternative 2. The overfished species interactions in the fisheries using pot gears were identified under Alternative 3, except that the Dungeness crab pot vessels are excluded under Alternative 5B. This results in overfished species impacts for pot gear for Alternative 5B that are slightly more than Alternative 3.

Dungeness crab vessels will continue to fish within the RCAs for Dungeness crab; the ability to use the gear to target overfished shelf species within the RCAs is limited. Overfished species interactions in the fisheries using trawl gears were identified under Alternative 4A. The Overfished species interactions in the fisheries using line gears was identified under Alternative 5A, except that 10 HMS line vessels are excluded and 234 salmon troll vessels are included under ALternative 5B. Historically, groundfish catch has not been a significant component in salmon troll fisheries. However, the fishery does encounter groundfish and historical landings data include lingcod, POP, bocaccio, canary rockfish, widow rockfish, and yelloweye rockfish. Table 3.3.3.5 shows that the greatest overfished species effect of salmon trolling on groundfish is on canary rockfish. The inclusion of salmon troll vessels is expected to result in impacts similar to those projected in Table 3.3.3.5. Salmon troll vessels will continue to fish within the RCAs for salmon, but the incentive to keep or target overfished species taken in waters within the RCAs, where retention is prohibited, is reduced. Because HMS line vessels are projected to catch very few overfished groundfish, the overfished species impacts for HMS line gear is slightly more than those identified under Alternative 3.

Vessels using longline or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term "fish" or "fishing" includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters. Under this alternative, the available data would be the similar to 5A. HMS vessels are currently prohibited from using longline gear in the EEZ, HMS longline gear is currently prohibited gear in the EEZ, therefore no OA groundfish landings are expected to occur by these vessels. Excludes would be: approximately 10 vessels per year that landed groundfish taken with line gear while targeting HMS; and the estimated 21 vessels per year between that landed groundfish taken with pot gear while targeting Dungeness crab. However, data from the estimated 234 salmon troll vessels would be available under this alternative.

Alternative 6A: Any vessel engaged in a commercial fishery to which a RCA restriction applies. Require all vessels engaged in a commercial fishery to which an RCA restriction applies to carry and use VMS transceivers and provide declaration reports. Vessels using salmon, Dungeness crab, or HMS gear that do not take and retain groundfish are excluded. Vessels using Coastal Pelagic Species (CPS) netgear are excluded because it is not legal gear for harvesting groundfish. Pink shrimp vessels are also excluded. Because there is no link to federal authority at this time (federal nexus), vessels that fish exclusively in state waters are excluded. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are the same vessels as those identified under Alternative 5A, except that all vessels using longline gear to target Pacific halibut would be included rather than only those vessels that take and retain, possess or land groundfish. Also, under this alternative, vessels using salmon troll, California halibut net and HMS net gears used to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery would be required to have and use VMS transceiver units and provide declaration reports. Between 2000 and 2004, an average of 65 vessels per year that are not registered to LE permits fished in the directed commercial fishery for Pacific halibut south of Point Chehalis. All of these vessels would be included under this alternative. This alternative also included all vessels using non-groundfish trawl gear. On average between 2000 and 2004 the number of vessels without LE groundfish permits was as follows: 40 vessels per year used non-groundfish trawl gear to fish for California halibut, 14 vessels per year used trawl gear to fish for sea cucumbers, and 23 vessels per year used trawl gear to fish for ridgeback prawn. Like Alternative 5B, vessels using salmon troll gear to fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery would also be required to carry and use VMS transceivers and provide declaration reports. Between 2000 and 2004, an average of 234 vessels per year landed groundfish taken with salmon troll gear. The annual exvessel revenue from groundfish taken by salmon troll vessels during this period was $73 per vessel. Bocaccio rockfish total catch mortality associated with CPS net gear was projected to be 0.3 mt, but would not be included under this alternative because it is not legal groundfish

gear. However, 3 vessels per year between 2000 and 2004 landed groundfish with a per vessel exvessel revenue of $17. Between 2000 and 2004, an average of 47 vessels per year landed groundfish while fishing for California halibut nets would be included under this alternative. Between 2000 and 2004, an average of 25 vessels per year landed groundfish while fishing for HMS with nets south of 38° N. lat. (Point Reyes) would also be included under this alternative. XXXHowever, current California state law prohibits the landing of rockfish with setnet gearXXX. These vessels are not projected to take any overfished species in 2005.

Overfished species interactions in the fisheries using longline gears were identified under Alternative 2 Because this alternative would include all 65 Pacific halibut vessels, rather than just those that landed groundfish, the impacts for that fishery would be those projected in Table 3.3.3.5. Overfished species interactions in the fisheries using pot gears were identified under Alternative 3. Overfished species interactions in the fisheries using trawl gears were identified under Alternative 4A. Overfished species interactions in the fisheries using line gears were identified under Alternative 5B, except that 10 HMS line vessels are included. Because HMS line vessels are projected to catch very few overfished groundfish, the overfished species impacts for line gear is similar to Alternative 3. Overfished species impacts from HMS and California halibut net vessels are included under this alternative. When gill nets are fished for California halibut, fishermen attach suspenders to the nets to create slack in the net so the halibut entangle or roll up in the nets rather than being caught by their gills (CDFG 2000). Large mesh is used in halibut gill nets and the nets are fished in soft bottom areas were rockfish are less likely to be found, therefore they are not projected to take significant numbers of rockfish. The overfished species found in association with California halibut are bocaccio, canary rockfish and widow rockfish. HMS net gear will continue to fish within the RCAs. Historically, only small amounts of lingcod, bocaccio and widow rockfish have been landed with HMS net gear, which is required to be used in waters deeper than 60 fathoms. The stretch mesh has a diameter greater than 14", typically 18"-20", and hangs below the surface, where pelagic groundfish species and those that rise off the ocean floor are most vulnerable.

Vessels using longline or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term “fish” or “fishing” includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters.

Alternative 6B: Any vessel engaged in a commercial fishery to which a RCA restriction applies, except salmon troll vessels operating in waters north of 40°10' N. lat. that only retain yellowtail rockfish. Require all vessels engaged in a commercial fishery to which an RCA restriction applies to carry and use VMS transceivers and provide declaration reports. Vessels using salmon, Dungeness crab, CPS or HMS gear that do not take and retain groundfish are excluded. Salmon troll vessels operating in waters north of 40°10' N. lat. that only retain yellowtail rockfish are excluded. Pink shrimp vessels are excluded. If an RCA requirement is discontinued during the year, mandatory VMS coverage would be discontinued for the affected vessels. Because there is no link to federal authority at this time (federal nexus), vessels that fish exclusively in state waters are excluded. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are the same vessels as those identified under Alternative 6A except that 58 salmon troll vessels operating in waters north of 40°10' N. lat. that only retain yellowtail rockfish are excluded. Initially, Alternative 6B affects 1,478 vessels. In the long term, fewer vessels may be affected than under Alternative 6A, because Alternative 6B includes a provision to discontinued mandatory VMS coverage for OA gear groups when the RCA requirements are discontinued. Overfished species interactions under this alternative are similar to those under Alternative 6A, except for

salmon troll vessels fishing north 40°10' N. lat. that land only yellowtail rockfish. Data on the overfished species impacts for salmon troll vessel are not available to more fully assess the changes in impacts between Alternatives 6A and 6B. Salmon troll vessels will continue to fish within the RCAs for salmon, but the incentive to keep or target overfished species taken in waters within the RCAs, where retention is prohibited, is increased over Alternative 6A for salmon troll vessels fishing north 40°10' N. lat.,

Vessels using longline or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term “fish” or “fishing” includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters.

Alternative 7: Any vessel engaged in a commercial fishery to which an RCA restriction applies, except vessels less than 12 feet in overall length. Require all vessels greater than 12 ft in length that are engaged in a commercial fishery to which an RCA restriction applies to carry and use VMS transceivers and provide declaration reports. Vessels using salmon, Dungeness crab, CPS or HMS gear that do not take and retain groundfish are excluded. Pink shrimp vessels are excluded. Vessels that fish exclusively in state waters are excluded. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are the same vessels as those identified under Alternative 6A, except that vessels less than 12 feet in length are excluded. An average of 22 vessels per year between 2000 and 2003 landed groundfish and were less than 12 feet in length. These vessels included 6 vessels that used longline gear, 2 vessels that used pot gear, and 14 vessels that used line gear.

Overfished species interactions under this alternative are similar to those under alternative 6A. Vessels using longline or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term “fish” or “fishing” includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters.

Alternative 8 - **Low impact OA fisheries** Require all vessels that fish in federal waters for which there is an RCA requirement, to carry and use VMS transceivers and to provide declaration reports except that vessels using pink shrimp trawl gear are excluded; vessels using gears where the best available data indicates that the incidental catch of overfished species is projected to be minimal would also be excluded. These low impact target fisheries and gear include: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot.

Because there is no link to federal authority at this time (federal nexus), vessels that fish exclusively in state waters are excluded. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas. A declaration report would be required prior to leaving port on a trip in which the

vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas.

Discussion: The vessels identified under this alternative are 282 groundfish directed longline vessels per year, 65 Pacific halibut vessels per year, 142 groundfish directed pot vessels per year, 40 California halibut trawl vessels per year, 590 groundfish directed line vessels per year, 234 salmon troll vessels per year, and 58 California halibut vessels per year.

Overfished species interactions in the fisheries using longline gears were identified under Alternative 2 Because this alternative would include all 65 Pacific halibut vessels, the impacts for that fishery would be those projected in Table 3.3.3.5. Overfished species interactions in the fisheries using pot gears were identified under Alternative 3. Under this alternative the Dungeness crab, California sheephead and spot prawn pot vessels are excluded. This results in overfished species impacts for pot gear that are slightly more than Alternative 3. Dungeness crab and spot prawn pot vessels will continue to fish within the RCAs; the ability to use the gear to target overfished shelf species within the RCAs is limited. California sheephead are shallow nearshore finfish. Historically, lingcod has been the dominant overfished species landed by vessels targeting California sheephead. High lingcod survival is projected when released alive from nearshore pots (>50%). A 1993 study by Marine Resources Division Department of Fish and Game State of California showed that there is a potential for the live-fish trap fishery to negatively affect nontarget finfish populations which raises concern about the potential impacts of the gear if used in areas and at time where it is otherwise restricted.

Overfished species interactions in the fisheries using trawl gears were identified under Alternative 4A and 4B. This alternative includes only California halibut trawl. Gear specific estimates for the nongroundfish trawl vessels that where the primary target species was California halibut were not available. Lingcod, bocaccio, canary rockfish and widow rockfish were historically landed by all California halibut gears combined (Table 3.3.3.6 and Table 3.3.3.7). The projections for 2005 are similar in composition (Table 3.3.3.5). The interaction with overfished species for Pink shrimp vessels is neutral because they are allowed to fish within the trawl RCA providing a declaration report is sent prior to leaving port on a trip and BRDs are used. The interaction with overfished species for ridgeback prawn trawls that operate south of Point Conception depend on the use of BRDs to reduce the catch of finfish and the integrity of RCAs. The risk of vessels not adhering to RCA requirements is greater under this alternative than under Alternatives 4A-7. Prior to implementation of the RCAs and the requirement to used BRDs, lingcod, darkblotched rockfish, bocaccio, canary rockfish, cowcod, widow rockfish and yelloweye were landed in the prawn (trap and trawl for all prawn species) fisheries (Table 3.3.3.6 and Table 3.3.3.7) south of 40˚10' N. latitude. For nongroundfish trawl vessels where the primary target species was sea cucumber, no overfished species catch was projected for 2005. Prior to the implementation of RCAs, less than 0.5 mt of all overfished species combined were landed by sea cucumber vessels in a given year (Table 3.3.3.6 and Table 3.3.3.7). Overfished species interaction would be slightly greater than Alternatives 4A-7 for sea cucumber vessels.

Overfished species impacts from California Halibut net vessels would be included under this alternative. When gill nets are fished for California halibut, fishermen attach suspenders to the nets to create slack in the net so the halibut entangle or roll up in the nets rather than being caught by their gills (CDFG 2000). Large mesh is used in halibut gill nets and the nets are fished in soft bottom areas where rockfish are less likely to be found, therefore they are not projected to take significant numbers of rockfish. The overfished species found in association with California halibut are bocaccio, canary rockfish and widow rockfish.

When considering the impacts of an incidental fishery on overfished species, the HMS net and line fisheries, the California sheephead pot fishery, the sea cucumber trawl fishery and the spot prawn trap fishery have historically landed the lowest amounts of overfished species (Tables 3.3.3.6 and 3.3.3.7) before RCA management was adopted. These fisheries are also projected to have the lowest fishing mortality in 2005 with RCA management (Table 3.3.3.5). With the exception of sea cucumber trawl, fishing for the target species occurs within the RCAs, although only groundfish on trips were no fishing occurs in the RCA may be retained. The fisheries with slightly greater impacts on overfished species, those where small amounts by weight and proportion of the available OY (less than 0.05%), were taken included the ridgeback prawn trawl fishery and the Dungeness crab pot fishery. The Dungeness crab fishery occurs within the RCAs and has historically landed only small amounts of overfished species. While the ridgeback

prawn trawl fishery has BRD requirements to reduce the catch of finfish, including overfished species, and has RCA restriction. In 1998, prior to the implementation of conservation areas and the BRD requirements, the prawn fisheries (all prawns) landed 0.7 mt of lingcod, 0.05 mt of darkbloched rockfish, 2.4 mt of bocaccio, 0.05 mt of canary rockfish, 1.2 mt of cowcod, and 0.05 mt of yelloweye rockfish (Table 3.3.3.7). Although the California gillnet fishery is projected to take a single overfished species, it is projected to have a greater impact with 0.5 mt of bocaccio by weight or 0.16% of the OY being taken.

Vessels using longline, line or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term "fish" or "fishing" includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters.

Table 2.0.2 Presence of overfished species in incidental nongroundfish fisheries (summarized from Tables 3.3.3.6 and 3.3.3.7)

	North of Mendocino				South of Mendocino		
Fishery (all gears)	1998	2000	2002		1998	2000	2002
California halibut	~	~	✢		✢✢✢	✢	✢✢✢
California gillnet	~	~	~		✢✢✢	✢	✢
California sheephead	~	~	~		✢	✢	✢
Dungeness crab	✢	✢	✢		✢	~	~
HMS	✢	✢	~		✢	✢	✢
Pacific halibut	✢✢✢	✢✢✢	✢✢✢		✢	~	~
Pink shrimp	✢✢✢	✢✢✢	✢✢✢		✢✢✢	✢	~
Prawn	~	~	~		✢✢✢	✢✢	✢
Salmon troll	✢✢✢	✢✢✢	✢✢✢		✢✢	✢✢	✢✢✢
Sea cucumber	~	~	~		✢	~	✢

✢✢✢ More than 0.5 mt of a single overfished species
✢✢ More than 0.5 mt of all overfished species combined
✢ Less than 0.5 mt of all overfished species combined
~ No overfished species landings data

Alternative 9 - Directed OA - Require all vessels that fish in federal waters for which there is an RCA requirement, to carry and use VMS transceivers and to provide declaration reports if they land more than 500 lb of groundfish in a calendar year. Because there is no link to federal authority at this time (federal nexus), vessels that fish exclusively in state waters are excluded. Prior to leaving port on a trip in which a vessel identified under this alternative is used to take and retain, possess, or land federally managed groundfish in federal waters, the vessel would be required to activate a VMS transceiver unit and to continuously operate the unit (24 hours a day) throughout the remainder of the calendar year. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas. A declaration report would be required prior to leaving port on a trip in which the vessel is used to fish in a GCA in a manner that is

consistent with the requirements of the conservation area. VMS requirements defined at 660.312 and prohibitions defined at 660.306 would apply to these vessels, as would the reporting requirements defined at 660.303 for vessels fishing in conservation areas

Discussion: The vessels identified under this alternative are 282 groundfish directed longline vessels per year, 6 Pacific halibut longline vessels per year (14 vessels if only 2003 & 2004 data used), 142 groundfish directed pot vessels per year, 1 Dungeness crab pot vessel per year, 2 prawn pot vessels per year, 2 California sheephead (CA nearshore.) vessels per year, 9 California halibut trawl vessels, 590 groundfish directed line vessels per year, no California halibut vessels, 1 HMS vessel, and 6 salmon troll vessels. The directed groundfish vessels that would be required to have and use VMS are the same as those identified in Alternatives 5-8. Incidental OA fishery vessels included under this alternative are only those vessels that landed more than 500 lb of groundfish in a calendar year.

Vessels using longline, line or pot gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in the OA fishery in federal waters. While, vessels using non-groundfish trawl gear would be required to operate their VMS units continuously from the point at which the vessel is used to fish in federal waters. The use of the term "fish" or "fishing" includes possessing federally managed groundfish in federal waters, even if the groundfish were taken and retained seaward of the EEZ or in state waters.

Overfished species interactions in the fisheries using longline gears were identified under Alternative 2 Because this alternative would include only 7 Pacific halibut vessels, may be incursions into the RCAs resulting in overfished species impacts greater than those identified in Table 3.3.3.5. for that fishery. However, given the short duration of the fishery and the permitting requirements, existing traditional enforcement resources may adequate to reduce the risk of incursions. Overfished species interactions in the fisheries using pot gears are similar to those identified under Alternative 8 because under this alternative only 1 Dungeness crab, 2 California sheephead and 2 spot prawn pot vessels are included. It is likely that these vessels would discard groundfish to avoid VMS requirements. Overfished species interactions in the fisheries using trawl gears are slightly more than those projected under Alternatives 1-3, because only 9 California halibut and 3 pink shrimp vessels would be required to have and use VMS. It is likely that these vessels would discard groundfish to avoid VMS requirements. Although 15 California halibut net gear vessels were identified, new state regulations prohibiting the landing of rockfish would likely result in no California halibut net gear vessels being required to have and use VMS; therefore, the interactions with overfished species would be similar to those under Alternatives 1-5B.

NOTE: If this alternative were defined as directed vessels only - "Require all vessels that fish in federal waters for which there is an RCA requirement, to carry and use VMS transceivers and to provide declaration reports if the sum of all groundfish in any landing exceeds 50% of the revenue on a fish ticket**.**" The following vessels would be included: 282 groundfish directed longline vessels per year, 142 groundfish directed pot gear vessels per year, and 590 groundfish directed vessels per year.

Alternative 10 - No Action Alternative No VMS requirements for vessels in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery. Discontinue RCA management areas defined at 660.383 (c) and adjust trip limits and seasons accordingly. Require declaration reports from OA non-groundfish trawl vessels that are using trawl gear, allowed by regulation, to fish within a trawl RCA.

Discussion: Vessels without LE permits that fish pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery would not be required to carry and use VMS transceiver units. However, vessels could elect to voluntarily carry a VMS transceiver unit and provide position reports to NMFS if they choose. Vessels registered to LE permits that operate in both LE and OA fisheries (fishing conducted with OA gear, by a vessel that has a valid LE permit with an endorsement for another type of gear) would continue to be required to carry and use a VMS transceiver and to provide declaration reports. Declaration reports would continue to be required from vessels using non-groundfish trawl gear whether or not groundfish are retained by the vessel.

Unlike Alternative 1, the non-trawl and trawl RCA requirements for directed and incidental fisheries would

be discontinued. Without the non-trawl and trawl RCAs, there is no need to have VMS to maintain the integrity of these RCAs. Non-trawl RCAs for the OA fisheries defined at 660.383(c)(3) and the trawl RCAs for the OA non-groundfish trawl fisheries defined at 660.383(c)(4) would be discontinued. The yelloweye RCA (a voluntary closure) defined at 660.383(c)(1) and cowcod conservation area defined at 660.383(c)(2) would be continued. State restrictions for states waters (0-3 nm) around the Farallon Islands and Cordell banks would remain in place. Traditional enforcement methods (such as aerial surveillance, boarding at sea via patrol boats, landing inspections and documentary investigation) would be the primary means to monitor compliance with the yellowtail rockfish and cowcod conservation areas as well as the Farallon Islands and Cordell banks areas.

Without non-trawl and trawl RCA restrictions for the OA vessels, the rate at which overfished species, particularly overfished shelf species, are encountered by OA vessels would be expected to increase. To prevent overfished species OYs from being exceeded, more restrictive trip limits would need to be adopted for all OA fisheries. The opportunity to harvest catch that may be found in the shelf areas would need to be greatly reduced. These more restrictive limits would be expected to not only constrain the effects of the OA fisheries on the overfished species OYs, but also to prevent excessive overfished species harvest in the OA fisheries from negatively affecting fishing opportunity in other sectors of the groundfish fishery. Only selective gears, those that have been proven to catch abundant species and that do not catch (or catch at extremely low rates) overfished species, would be allowed to continue on the shelf. The directed OA fisheries would be most affected by the limit reductions. Limits for the incidental OA fishers would accommodate low levels of incidental catch while not creating incentives to target groundfish.

Opportunities for some slope and nearshore species would be similar to those limits that have been in place for 2005. Deeper slope species, such as darkblotched rockfish and POP, are more vulnerable to LE trawl gear and historically have been taken in small proportions in the OA fishery. Nearshore fisheries, particularly with higher black rockfish limits, will likely result in higher lingcod catch. However, lingcod caught and discarded in nearshore areas are expected to have a relatively low mortality rate. Because lingcod are also distributed in shelf areas, where yelloweye and canary rockfish may be affected, it would be necessary to reduce lingcod limits to eliminate targeting opportunities.

If the cost of fuel remains high, as in 2005, fishers may choose to travel less distance to the fishing grounds and operate in the shelf areas rather than in slope areas when there is opportunity. Sablefish, though smaller in size, are also found shelf areas; therefore, the opportunity to harvest sablefish would be reduced. Similarly, flatfish opportunity would remain only for those OA vessels that use number 2 hooks with hook-and-line gear, because the selectivity of the gear. There would be no opportunities for shelf rockfish species. Example trip limit tables for the OA fisheries under Alternative 10 are shown below in Table 2.0.3 and Table 2.0.4.

Reduced trip limits are likely to result in lower gross revenues for some vessels, and this is likely to result in lower net revenues. Those vessels that are more actively engaged in the directed open access fishery by pursuing and achieving the open access cumulative limits are more likely to bear a higher proportion of lost revenues than vessels that are not actively engaged in the directed open access fishery. If vessels more actively engaged in the directed open access fishery are more reliant on revenues from those fisheries than vessels not actively pursuing existing cumulative limits, then the impact of reduced open access limits is likely to result in a lower standard of living for vessel operators actively engaged in directed open access fisheries.

If projections show that trip limits alone do not keep the total catch of overfished species within the specified OY, harvest guidelines or allocations, additional measures such as closed seasons would need to be used, or reductions in catch available to other sectors of the fishery (LE and recreational) may also need to be reduced. To keep the mortality of overfished species within their OYs, regulatory provisions at 50 CFR 660.370 (h)(7) concerning vessels that operate in both limited entry and open access fisheries would need to be revised to prevent vessels registered to LE groundfish permits from accessing the OA limits while operating within the RCAs.

Table 2.0.3. (North) to Part 660, Subpart G -- Alternative 10 Trip Limits for Open Access Gears North of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table 122004

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC	
See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Restrictions.								
1	**Minor slope rockfish[1/] & Darkblotched rockfish**	Per trip, no more than 25% of weight of the sablefish landed						
2	**Pacific ocean perch**	100 lb/ month						
3	**Sablefish**	100 lb/ day, or 1 landing per week of up to 300 lb, not to exceed 1,200 lb/ 2 months						
4	**Thornyheads**	CLOSED						
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. May only be landed with by vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line. Otherwise CLOSED						
6	**Arrowtooth flounder**							
7	**Petrale sole**							
8	**English sole**							
9	**Other flatfish[2/]**							
10	**Whiting**	CLOSED						
11	**Minor shelf rockfish[1/], Shortbelly, Widow, & Yellowtail rockfish**	CLOSED						
12	**Canary rockfish**	CLOSED						
13	**Yelloweye rockfish**	CLOSED						
14	**Minor nearshore rockfish & Black rockfish**	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]						
15	**Lingcod[4/]**	CLOSED		100 lb/ month			CLOSED	
16	**Other Fish[5/] & Pacific cod**	Not limited						
17	**PINK SHRIMP NON-GROUNDFISH TRAWL**							
18	North	**Effective April 1 - October 31:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.						
19	**SALMON TROLL**							
20	North	Salmon trollers may retain and land up to 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month. This limit is within the 200 lb per month combined limit for all grounfish and is not in addition to that limit. All groundfish species are subject to the limits, seasons, restrictions listed above in this table.						

North

1/ Bocaccio, chilipepper and cowcod rockfishes are included in the trip limits for minor shelf rockfish. Splitnose rockfish is included in the trip limits for minor slope rockfish.

2/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.

3/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

4/ The size limit for lingcod is 24 inches (61 cm) total length.

5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2.0.4. (South) to Part 660, Subpart G -- Alternative 10 Trip Limits for Open Access Gears South of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table 122004

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC	
	See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Restrictions.							
1	**Minor slope rockfish[1/] & Darkblotched rockfish**							South
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed						
3	South of 38° N. lat.	10,000 lb/ 2 months						
4	**Splitnose**	CLOSED						
5	**Sablefish**							
6	40°10' - 36° N. lat.	100 lb/ day, or 1 landing per week of up to 300 lb, not to exceed 1,200 lb/ 2 months						
7	South of 36° N. lat.	150 lb/ day, or 1 landing per week of up to 350 lb						
8	**Thornyheads**							
9	40°10' - 34°27' N. lat.	CLOSED						
10	South of 34°27' N. lat.	50 lb/ day, no more than 300 lb/ 2 months						
11	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. May only be landed with by vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line. Otherwise CLOSED						
12	**Arrowtooth flounder**							
13	**Petrale sole**							
14	**English sole**							
15	**Other flatfish[2/]**							
16	**Whiting**	CLOSED						
17	**Minor shelf rockfish[1/], Shortbelly, Widow & Chilipepper rockfish**	CLOSED						
20	**Canary rockfish**	CLOSED						
21	**Yelloweye rockfish**	CLOSED						
22	**Cowcod**	CLOSED						
23	**Bocaccio**	CLOSED						
26	**Minor nearshore rockfish & Black rockfish**							
27	Shallow nearshore	300 lb/ 2 months	CLOSED	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months	
28	Deeper nearshore							
29	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED	500 lb/ 2 months		400 lb/ 2 months	500 lb/ 2 months	
30	South of 34°27' N. lat.			600 lb/ 2 months			400 lb/ 2 months	
31	California scorpionfish	300 lb/ 2 months	CLOSED	300 lb/ 2 months	400 lb/ 2 months		300 lb/ 2 months	
32	**Lingcod[3/]**	CLOSED		100 lb/ month, when nearshore open			CLOSED	
33	**Other Fish[4/] & Cabezon**	Other fish CLOSED, Cabazon and Kelp Greenling unlimited						

Table 2.0.4. (South) Continued

34	**PINK SHRIMP NON-GROUNDFISH TRAWL GEAR**		**South con't**
35	South	**Effective April 1 - October 31:** Groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/ month (minimum 24 inch size limit); sablefish 2,000 lb/ month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.	
36	**RIDGEBACK PRAWN AND, SOUTH OF 38°57.50' N. LAT., CA HALIBUT AND SEA CUCUMBER NON-GROUNDFISH TRAWL**		
45		Groundfish 300 lb/trip. Trip limits in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and thornyheads south of Pt. Conception and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip. Vessels participating in the California halibut fishery south of 38°57'30" N. lat. are allowed to (1) land up to 100 lb/day of groundfish without the ratio requirement, provided that at least one California halibut is landed and (2) land up to 3,000 lb/month of flatfish, no more than 300 lb of which may be species other than Pacific sanddabs, sand sole, starry flounder, rock sole, curlfin sole, or California scorpionfish (California scorpionfish is also subject to the trip limits and closures in line 31).	

1/ Yellowtail rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
2/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
3/ The size limit for lingcod is 24 inches (61 cm) total length.
4/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Pacific cod is included in the trip limits for "other fish."
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

2.3 Alternatives rejected from further analysis

VMS coverage of the recreational fisheries is not being considered at this time. At its October 2003 meeting, the ad hoc VMS Committee considered expansion of the VMS program, including expansion into the charter and private sectors of the recreational fishery. After considerable discussion, the committee recommended that an area-by-area evaluation of the groundfish impacts by these participants was necessary before a final recommendation could be made.

The pink shrimp fisheries were originally not included in the alternatives for VMS coverage. Pink shrimp vessels are allowed to fish within the trawl RCA providing a declaration report has been sent prior to leaving port on a trip in which the vessel is used to fish within a GCA or RCA. Pink shrimp trawl vessels were excluded in the coverage alternatives, because they are required to use finfish excluders, which dramatically reduce their catch of overfished species, primarily canary rockfish. At the Council's June 2005 meeting, the Council considered management alternatives to reduce the impacts of fishing on Pacific coast groundfish EFH, as mandated by the Magnuson-Stevens Act. The focus on protecting habitat from bottom trawl impacts resulted in the Council recommending that NMFS adopt many new closed areas for bottom trawl gear. For monitoring the integrity of these habitat protection measures, vessels using trawl gear to target pink shrimp that do not already have a LE permit registered to the vessel, were recommended for inclusion into the OA VMS alternatives.

The salmon troll fisheries are allowed to fish within the non-trawl RCA and are allowed to retain some groundfish. Because VMS cannot be used to determine where a particular species was caught on individual fishing trips where activities occur both inside and outside RCAs, it was not originally considered to be an effective enforcement tool for monitoring OA trip limit compliance by salmon troll vessels.

State and federal fisheries in which groundfish are incidentally taken, but not landed were not included in the analysis because fisheries where groundfish catch is not landed are not considered to be OA fishery. These vessels include: the those targeting CPS squid, CPS wetfish, or HMS with purse seine gear.

3.0 AFFECTED ENVIRONMENT

The purpose of this EA is to analyze a range of alternatives for expanding the VMS program into the OA groundfish fisheries off the coasts of Washington, Oregon, and California. The affected environment includes: the geographical location in which these fisheries occur; the groundfish and other species these vessels harvest and interact with; the fish buyers and processors that are dependent on the fishery; the suppliers and services; and ultimately, and the fishing-dependent communities where vessels dock and fishing families live. The following section of this document, Section 3, describes the physical, biological, and socio-economic characteristics of the affected environment.

3.1 Physical Environment

EFH for Pacific Coast groundfish is defined as the aquatic habitat necessary to allow for groundfish production to support long-term sustainable fisheries for groundfish and for groundfish contributions to a healthy ecosystem. When these EFHs for all groundfish species are taken together, the groundfish fishery EFH includes all waters from the mean higher high water line, and the upriver extent of saltwater intrusion in river mouths seaward to the boundary of the U.S. EEZ.

This is a tiered EA that expands on information presented in the original July 2003 VMS EA titled, The Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery. Section 3.1, Physical Environment, of the original EA contained detailed information on the marine ecosystem. In addition, Section 3.2 of the February 2005 Draft EFH EIS titled: The Pacific Coast Groundfish Fishery Management Plan, EFH Designation and Minimization of Adverse Impacts, contains further information on the physical environment. Readers who are interested in more detailed information on the physical environment than is provided in this EA are referred to the EFH EIS. A copy of the EFH EIS can be obtained by contacting the Sustainable Fisheries Division, Northwest Region, NMFS, by writing to 7600 Sand Point Way, NE, Seattle, WA 98115–0070; or calling 206-526-6187 or 206-526-4490; or viewing the internet posting at http://www.nwr.noaa.gov/.

3.1.1 Current Habitat Protection Areas

There are many areas off the West Coast where marine habitat is afforded some level of protection through existing regulations. These are areas that have been established by federal, state, and local agencies or other organizations. Areas may have been established to regulate navigation, restrict access (e.g., for security or fishing purposes), protect certain natural resources, regulate use, or for other purposes. These areas are known generally as marine managed areas, but are more specifically called National Wildlife Refuges, National Marine Sanctuaries, fishery closure areas, State Parks, oil platform navigation safety zones, national security zones, marine protected areas, or marine reserves. Of the 321 distinct marine management areas, fifty nine may be considered marine reserves where all fishing is prohibited due either to specific fishing regulations or to access restrictions. Some sites may, for example, prohibit commercial fishing but allow recreational fishing; others allow fishing for some, but not all species of fish or invertebrates. Still others may only regulate fishing for one type of organism. A description of the existing marine managed areas is contained in Section 3.6 of the Pacific Coast Groundfish Fishery Management Plan, EFH Designation and Minimization of Adverse Impacts, Draft EFH EIS.

At the Council's June 2005 meeting, it adopted a preferred alternative for the "Essential Fish Habitat Designation and Minimization of Adverse Impacts Draft EIS." The Council's preferred alternative included a recommendations for designating: Habitat Areas of Particular Concern (HAPC); areas where gear restrictions will to protect habitat; and ecologically important areas that are to be closed to specified gear types. Amendment 19 to the groundfish FMP is being developed to authorizes these new groundfish habitat protection closures. The Council's final recommendations on Amendments 19 are scheduled for their November 2005 meeting. Background information and supporting documentation for the Council's recommendation can be found within that EFH EIS.

3.2 Biological Environment

3.2.1 Groundfish Resources

The Pacific Coast groundfish FMP manages over 90+ species, which are divided into the following groups: roundfish, flatfish, rockfish, sharks, skates, ratfish, morids, and grenadiers. These species occur throughout the EEZ and occupy diverse habitats at all stages in their life history. Information on the interactions between the various groundfish species and between groundfish and non-groundfish species varies in completeness. While a few species have been intensely studied, there is relatively little information on most groundfish species.

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

Harvest levels or optimum yields (OYs) are established for the species or species groups that the Council proposes to manage. In 2005, OYs are defined for the following groundfish species and species groups: bocaccio, black rockfish, cabezon, canary rockfish, chilipepper rockfish, cowcod, darkblotched rockfish, Dover sole, lingcod, longspine thornyhead, the minor rockfish complexes (the unassessed northern and southern nearshore, continental shelf, and continental slope rockfish species,) Pacific cod, POP, Pacific whiting, sablefish, shortbelly rockfish, shortspine thornyhead, splitnose rockfish, widow rockfish, yelloweye rockfish, and yellowtail rockfish. Numerical OYs are not set for every stock.

The Magnuson-Stevens Act requires an FMP to prevent overfishing. Overfishing is defined in the National Standards Guidelines (63 FR 24212, May 1, 1998) as exceeding the fishing mortality rate needed to produce maximum sustainable yield. The OY harvest levels are set at levels that are expected to prevent overfishing, equal to or less than the ABCs. The term “overfished” describes a stock whose abundance is below its overfished/rebuilding threshold. Overfished/rebuilding thresholds are generally linked to the same productivity assumptions that determine the ABC levels. The default value of this threshold for the groundfish FMP is 25% of the estimated unfished biomass level. In 2005, eight groundfish species continue to be designated as overfished: bocaccio (south of Monterey), canary rockfish, cowcod (south of Point Conception), darkblotched rockfish, lingcod, Pacific ocean perch, widow rockfish, and yelloweye rockfish.

This is a tiered EA that expands on information presented in the July 2003 EA titled, The Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery. Section 3.2, Biological Environment, of the original EA, contained detailed biological information on the groundfish resources. Therefore this EA contains a summary of information provided in the original EA. Readers who are interested in further information on the status of the groundfish resources, including the status of overfished species, are referred to Section 4.0 of the EIS, prepared by the Pacific Fishery Management Council, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery. Copies of the EIS can be obtained from the Pacific Fishery Management Council, by writing to 7700 NE Ambassador Place, Suite 200, Portland, OR 97220-1384; or calling 503 820-2280; or viewing the internet posting at http://www.pcouncil.org.

3.2.2 Endangered Species

West Coast marine species listed as endangered or threatened under the ESA include 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. Table 3.2.2.1 lists the species are subject to the conservation and management requirements of the ESA because they are listed as threatened or endangered.

Table 3.2.2.1. West Coast Endangered Species

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

Marine Mammals: Table 3.2.3.1 of the original VMS EA identified marine mammal communities by depth categories (nearshore, shelf and slope depth) that approximate those defined by the RCAs for three coastal regions, which included southern California, central to northern California, and Oregon to British Columbia.

Seabirds: Over sixty species of seabirds occur in waters off the West Coast within the EEZ, including: 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 areas where OA commercial fishing occurs; commercial fishing also occurs near the breeding colonies of many of these species. Besides entanglement in fishing gear, seabirds may be indirectly affected by commercial fisheries in various ways. Change in prey availability may be linked to 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. Under the Magnuson-Stevens Act, NMFS is required to ensure fishery management actions comply with other laws designed to protect seabirds.

Sea Turtles: Sea turtles are highly migratory; four of the six species found in U.S. waters have been sighted off the West Coast. Little is known about the interactions between sea turtles and West Coast commercial fisheries. The directed fishing for sea turtles in West Coast groundfish fisheries is prohibited, because of their ESA listings. Sea turtles have been 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 directed groundfish fisheries, the expected take of sea turtles is minimal in the directed OA groundfish fisheries.

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

critical portions of these ranges are the freshwater spawning grounds and migration routes. The OA groundfish fishery includes vessels that take and retain groundfish while using troll gear to target salmon.

This is a tiered EA that expands on information presented in the original July 2003 EA titled, "The Program to Monitor Time-Area Closures in the Pacific Coast Groundfish Fishery" Section 3.2.2 of the original EA, "Endangered Species" contains more detailed information on these resources.

3.2.3 Non-groundfish Species Interactions

Dungeness Crab: Dungeness crab (*Cancer magister*) are distributed from the Aleutian Islands, Alaska, to Monterey Bay, California. They live in bays, inlets, around estuaries, and on the continental shelf. Dungeness crab are found to a depth of about 180 m (98 fm). Although Dungeness crab are found on mud and gravel, it is most abundant on sandy bottoms and in eelgrass. Dungeness crab, are typically harvested using traps (crab pots), ring nets, by hand (scuba divers) or dip nets, and may be incidentally taken or harmed unintentionally by groundfish gears.

Highly Migratory Species: Highly migratory species (HMS) include five tuna species, five shark species, striped marlin, swordfish, and dorado or dolphinfish. tunas, billfish, dorado, and sharks. HMS species range great distances during their lifetime, extending beyond national boundaries into international waters and among the EEZs of many nations in the Pacific. In 2003, the Council adopted a Highly Migratory Species FMP (PFMC 2003) to federally regulate the take of HMS within and outside the U.S. West Coast EEZ. NMFS approved the FMP, allowing implementation, on January 30, 2004. Appendix A of the HMS FMP contains detailed information on life history and essential fish habitat for these species. Copies of the HMS FMP can be obtained from the Pacific Fishery Management Council, by writing to 7700 NE Ambassador Place, Suite 200, Portland, OR 97220-1384; or calling 503 820-2280; or viewing the internet posting at http://www.pcouncil.org.

Pacific Pink Shrimp: Pacific pink shrimp (*Pandalus jordani*) are found from Unalaska in the Aleutian Islands to San Diego, California, at depths of 25 to 200 fm (46 to 366 m). Off the U.S. West Coast, these shrimp are harvested with trawl gear from northern Washington to central California between 60 and 100 fm (110 to 180 m). The majority of the catch is taken off the coast of Oregon. Concentrations of pink shrimp are associated with well-defined areas of green mud and muddy-sand bottom.

Ridgeback prawn: Ridgeback prawns (*Sicyonia ingentis*) are found south of Monterey, California to Baja, California in depths of 145 feet (73 fm) to 525 feet (263 fm) (Sunada *et al.* 2001). They are more abundant south of Point Conception and are the most common invertebrate appearing in trawls. Their preferred habitat is sand, shell and green mud substrate, and they are relatively sessile. Although information about their feeding habits is limited, these prawns probably are detritus feeders. In turn, they are prey for sea robins, rockfish, and lingcod. Unlike other shrimp species, which carry their eggs during maturation, ridgeback prawns release their eggs into the water column. They spawn seasonally from June to October. Surveys recorded increasing abundance of ridgeback prawns from 1982, when surveys began, to 1985. The population then declined. More recent CPUE data suggest increased abundance in the 1990s. These changes may be due to climate phenomena, particularly El Niño events.

Pacific Halibut:. Pacific halibut (*Hippoglossus stenolepis*), in the family Pleuronectidae, range along the continental shelf in the North Pacific and Bering Sea in waters of 22 to 366 fm (40 to 200 m). They have flat, diamond-shaped bodies and may migrate long distances. Juvenile halibut, mostly shorter than the legal size limit, tend to migrate from north to south until they reach maturity. Adult halibut migrate from shallow summer feeding grounds to deeper winter spawning grounds. Most adult fish return to the same feeding grounds each summer where most commercial and recreational fishing occurs.

California Halibut: California halibut (*Paralichthys californicus*) are a left-eyed flatfish of the family Bothidae. They range from Northern Washington at approximately the Quileute River to southern Baja, California (Eschmeyer et al. 1983), but are most common south of Oregon. The center of distribution occurs south of Oregon. They predominantly associate with sand substrates from nearshore areas just beyond the surf line to about 183 m. California halibut feed on fishes and squids and can take their prey well off the bottom. They are an important sport and commercial species, especially in California where they are targeted using hook-and-line and trawl gear.

California Sheephead: California sheephead (*Semicossyphus pulcher*) are a large member of the wrasse family Labridae. They range from Monterey Bay south to Guadalupe Island in central Baja, California and in the Gulf of California, but are uncommon north of Point Conception. They can live to 50 years of age and attain a maximum length of 91 cm (16 kg). Like some other wrasse species, California sheephead change sex starting first as a female, but changing to a male at about 30 cm in length.

Coastal Pelagic Species (CPS): CPS are schooling fish not associated with the ocean bottom, that migrate in coastal waters. These species include: northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), Pacific (chub) mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*) and market squid (*Loligo opalescens*). These species are managed under the Coastal Pelagic Species Fishery Management Plan. Sardines inhabit coastal subtropical and temperate waters and at times have been the most abundant fish species in the California current. During times of high abundance, Pacific sardine range from the tip of Baja California to southeastern Alaska. When abundance is low, Pacific sardine do not occur in large quantities north of Point Conception, California. Pacific (chub) mackerel range from Banderas Bay, Mexico to southeastern Alaska. They are common from Monterey Bay, California to Cabo San Lucas, Baja California, and most abundant south of Point Conception, California. The central subpopulation of northern anchovy ranges from San Francisco, California to Punta Baja, Mexico. Jack mackerel are a pelagic schooling fish that range widely throughout the northeastern Pacific, however much of their range lies outside the U.S. EEZ. Adult and juvenile market squid are distributed throughout the Alaska and California current systems, but are most abundant between Punta Eugenio, Baja California and Monterey Bay, Central California.

Stock assessments for Pacific sardine and Pacific mackerel from December 1999 and July 1999, respectively, indicate increasing relative abundance for both species. Pacific sardine biomass in U.S. waters was estimated to be 1,581,346 mt in 1999; Pacific mackerel biomass (in U.S. waters) was estimated to be 239,286 mt. Pacific sardine landings for the directed fisheries off California and Baja California, Mexico, reached the highest level in recent history during 1999, with a combined total of 115,051 mt harvested. In 1998, near-record landings of 70,799 mt of Pacific mackerel occurred for the combined directed fisheries off California and Baja California.

Population dynamics for market squid are poorly understood, and annual commercial catch varies from less than 10,000 mt to 90,000 mt. They are thought to have an annual mortality rate approaching 100%, which means the adult population is almost entirely new recruits and successful spawning is crucial to future years' abundance. Amendment 10 to the CPS FMP (January 27, 2003; 68 FR 3819- Available online at http://www.gpoaccess.gov/fr/index.html) describes and analyzes several approaches for estimating an MSY proxy for market squid.

Sea Cucumber: Two sea cucumber species are targeted commercially: the California sea cucumber *(Parastichopus californicus*) and the warty sea cucumber (*P. parvimensis*) (Rogers-Bennett and Ono 2001). These species are tube-shaped Echinoderms, a phylum that also includes sea stars and sea urchins. The California sea cucumber occurs as far north as Alaska, while the warty sea cucumber is uncommon north of Point Conception and does not occur north of Monterey. Both species are found in the intertidal zone to as deep as 300 feet. These bottom-dwelling organisms feed on detritus and small organisms found in the sand and mud. Because sea cucumbers consume bottom sediment and remove food from it, they can alter the substrate in areas where they are concentrated. They can also increase turbidity as they excrete ingested sand or mud particles. Sea stars, crabs, various fishes, and sea otters prey upon them. They spawn by releasing gametes into the water column, and spawning occurs simultaneously for different segments of a population. During development, they go through several planktonic larval stages, settling to the bottom two months to three months after fertilization of the egg. Little is known about the population status of these two species; and assessment is difficult, because of their patchy distribution. However, density surveys suggest abundance has declined since the late 1980s, which is not unexpected since a commercial fishery for these species began in the late 1970s and expanded substantially after 1990.

Spot prawn: Spot prawn (*Pandalus platyceros*) are the largest of the pandalid shrimp and range from Baja, California north to the Aleutian Islands and west to the Korean Strait (Larson 2001). They inhabit rocky or hard bottoms including coral reefs, glass sponge reefs, and the edges of marine canyons. They have a patchy distribution, which may result from active habitat selection and larval transport. Spot prawns are hermaphroditic, first maturing as males at about three years of age. They enter a transition phase after mating at about four years of age when they metamorphose into females. Spot prawns are taken by both traps and

trawls on the West Coast with the fishery taking predominantly older females. Further information on the biological environment can be found in Section 3 of the Pacific Coast Groundfish Fishery Management Plan, EFH Designation and Minimization of Adverse Impacts, Draft EIS, prepared in February 2005.

3.3 SOCIO-ECONOMIC ENVIRONMENT

3.3.1 Conservation Areas and Depth-Based Management.

Since 1998, groundfish management measures have been shaped by the need to rebuild overfished groundfish stocks. The 90+ species in the West Coast groundfish complex mix with each other to varying degrees throughout the year and in different portions of the water column. Some species, like Pacific whiting, are strongly aggregated, making them easier to target with relatively little bycatch of other species. Conversely, other species like canary rockfish may occur in species-specific clusters, but are also found co-occurring with a wide variety of other groundfish species.

Over the past several years, groundfish management measures have been carefully crafted to recognize the tendencies of overfished species to co-occur with healthy stocks in certain times and areas. Management measures have been specifically designed to reduce incidental interception of overfished species taken in fisheries targeting more abundant stocks. To reduce the incidental catch of overfished species, trip limits for target species that co-occurrence with overfished species have been reduced and large geographically defined conservation areas (GCAs and RCAs) have been used to restrict or prohibit fishing activity.

The Council and NMFS began using conservation areas to reduce fisheries impacts on overfished groundfish species in 2001. NMFS initially defined two Cowcod Conservation Areas (CCAs) in the Southern California Bight. These areas were closed to recreational and commercial fishing for groundfish. These closures were located in areas of known cowcod abundance and were intended to prevent fishing vessels from taking cowcod either directly or incidentally in fisheries targeting other species. The CCAs have remained in place since 2001 and continue to be a central part of the Council's long-term rebuilding strategy for cowcod.

In September 2002, NMFS introduced its first large-scale conservation area, known as the Darkblotched Rockfish Conservation Area (DBCA). The DBCA extended from the U.S/Canada border to Cape Mendocino, California and had seaward and shoreward boundary lines approximating the 100 fm (183 m) and 250 fm (457 m) depth contours. Trawling was prohibited within the DBCA. The closure of this area to trawling was intended to reduce incidental darkblotched rockfish interception by fisheries targeting more abundant (continental) slope species.

Beginning in 2003, the Council recommended a greater suite of area closures intended to protect different overfished species, particularly overfished shelf species, from incidental harvest by vessels targeting other more abundant species. Similar to Council efforts to craft landings limits and seasons to protect overfished species, the 2003 conservation areas were intended to protect overfished species at depths where they are most often encountered and from gear that is most likely to catch those species. For example, POP has historically been taken almost exclusively by trawl gear, while yelloweye rockfish is more susceptible to hook-and-line gear used in commercial and recreational fisheries.

The suite of GCAs areas that affect the open access fisheries currently includes the two CCAs; the Yelloweye RCA off the Washington coast, the groundfish trawl, non-groundfish trawl and the nontrawl RCAs. The trawl and nontrawl RCAs extended along the entire length of the West Coast and are based on ocean bottom depths. The non-groundfish trawl RCAs are found in waters off southern California. The RCAs can vary seasonally depending on when and where the overfished species targeted for protection were taken by historic fisheries. RCA boundary lines were designated by a series of latitude/longitude coordinates intended to approximate ocean bottom depth contours delineating overfished species habitats. A more in-depth discussion of the introduction of depth-based management to West Coast groundfish fisheries management is provided in the proposed rule to implement the 2003 and 2004 specifications and management measures (January 7, 2003, 68 FR 936 and January 8, 2004, 68 FR 1380 -- Available online at http://www.gpoaccess.gov/fr/index.html).

3.3.2 Commercial fisheries

Commercial fisheries land a larger portion, by weight, of West Coast fish than any other group. CPS, followed by groundfish, crab, and HMS have made up the largest landings by weight since 2000. Crab, followed by groundfish, CPS, and HMS were the highest-valued fisheries between 2000 and 2003 (Table 3.3.2.1). During this same period, the gear groups with the largest amount of landings, by weight, were gill net, trammel net, trawl, trap/pot, and troll gear (Table 3.3.2.2)

In 1994, NMFS implemented Amendment 6 to the groundfish FMP, a license limitation program intended to restrict vessel participation in the directed commercial groundfish fisheries off Washington, Oregon, and California. The LE permits that were created specified the type of gear that a permitted vessel could use in the LE fishery. Each LE permit also had an associated vessel length. Most of the Pacific Coast non-tribal commercial groundfish harvest is taken by vessels registered to LE permits that use trawl, longline, and trap (or pot) gears.

There are also several OA fisheries that take groundfish incidentally to their intended target species or who directly target groundfish. Participants in those fisheries may use, among other gear types, longline, vertical hook-and-line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl. These vessels may hold various state issue licences and permits, yet they do not hold a federal groundfish LE permit. Though the overall OA groundfish landings are much smaller than LE landings, they are part of the economic make-up of West Coast groundfish vessels.

As of August 2004, there were 406 vessels with Pacific Coast groundfish LE permits, of which approximately 43% were trawl only vessels, 48% were longline only vessels, 7% were trap vessels, and the remaining 2% were combinations of 2 or more gears. The number of vessels registered for use with LE permits has decreased since the implementation of the permit stacking program for sablefish-endorsed LE fixed gear permits in 2001 and the LE trawl vessel buyback program in late 2003.

Table 3.3.2.1. Shoreside Landings and Exvessel Revenue by Species Category and Year

		Year			
Species Group	Data type	2000	2001	2002	2003
CPS	Landed weight (lbs)	498,232,740	431,544,771	403,146,744	266,368,388
	Exvessel Revenue ($)	42,069,760	32,494,118	32,732,787	33,824,432
Crab	Landed weight (lbs)	30,562,479	26,645,343	37,156,344	75,126,504
	Exvessel Revenue ($)	64,575,735	54,017,788	62,570,332	118,393,209
Groundfish	Landed weight (lbs)	268,754,713	226,402,046	164,010,829	180,765,829
	Exvessel Revenue ($)	62,689,248	52,034,893	43,438,224	48,945,438
HMS	Landed weight (lbs)	23,217,661	27,365,996	23,269,259	38,071,415
	Exvessel Revenue ($)	22,790,849	24,253,397	17,256,645	28,126,563
Other	Landed weight (lbs)	21,579,099	19,705,423	20,890,419	16,868,699
	Exvessel Revenue ($)	27,123,067	23,982,459	23,098,380	20,616,940
Salmon	Landed weight (lbs)	7,122,757	6,458,681	9,790,983	11,493,417
	Exvessel Revenue ($)	13,962,096	10,605,885	14,345,088	20,959,564
Shellfish	Landed weight (lbs)	18,101,109	18,552,442	27,117,595	26,746,585
	Exvessel Revenue ($)	45,577,879	44,101,002	61,294,480	69,678,867
Shrimp	Landed weight (lbs)	35,906,296	40,960,953	57,818,606	32,160,356
	Exvessel Revenue ($)	20,543,414	16,753,777	21,407,954	11,479,887
Total Landed weight (lbs)		903,476,854	797,635,655	743,200,779	647,601,193
Total Exvessel Revenue ($)		299,332,048	258,243,320	276,143,890	352,024,899

Source: PacFIN ftl table. August 2004
Note: Data shown is for PFMC management areas and does not include inside waters such as Puget Sound and Columbia River.

Table 3.3.2.2. Shoreside Landings and Revenue by Gear Type and Year

		Year			
Gear	Data type	2000	2001	2002	2003
Dredge	Landed weight (lbs)			C	
	Exvessel Revenue ($)			C	
Hook and Line	Landed weight (lbs)	11,802,585	11,020,956	12,614,636	10,825,355
	Exvessel Revenue ($)	20,935,838	19,225,187	17,679,231	19,776,877
Misc	Landed weight (lbs)	35,380,715	33,635,105	42,904,188	38,561,396
	Exvessel Revenue ($)	62,944,925	58,034,808	74,019,410	79,445,478
Net	Landed weight (lbs)	502,470,237	435,111,623	406,345,771	268,877,740
	Exvessel Revenue ($)	48,226,898	36,665,962	36,382,949	36,919,258
Pot	Landed weight (lbs)	33,746,129	29,263,663	39,942,815	78,765,977
	Exvessel Revenue ($)	75,724,736	64,286,487	71,891,553	129,824,380
Troll	Landed weight (lbs)	25,541,566	28,789,324	27,054,341	45,832,676
	Exvessel Revenue ($)	29,247,312	29,245,055	25,667,562	43,931,473
Trawl	Landed weight (lbs)	259,658,663	220,003,436	157,474,652	173,261,044
	Exvessel Revenue ($)	43,868,230	36,547,531	31,428,967	33,034,613
Shrimp Trawl	Landed weight (lbs)	34,876,959	39,811,548	56,862,974	31,477,005
	Exvessel Revenue ($)	18,384,109	14,238,290	19,072,882	9,092,821
Total Landed weight (lbs)		903,476,854	797,635,655	743,199,377*	647,601,193
Total Exvessel Revenue ($)		299,332,048	258,243,320	276,142,553*	352,024,899

Source: PacFIN ftl table. August 2004. Note: Data is for PFMC management areas only and doesn't include Puget Sound and Columbia River
C means data was restricted due to confidentiality

3.3.3 Open Access Groundfish Fisheries

Unlike the LE sector, the OA fishery has unrestricted participation and is comprised of vessels targeting or incidentally catching groundfish with a large variety of gears. OA vessels must comply with cumulative trip limits established for the OA sector and are subject to the other operational restrictions imposed in the regulations, including the GCA and RCA restrictions. While the OA groundfish fishery is under federal management and does not have participation restrictions, some state and federally managed fisheries that land groundfish in the OA fishery have implemented their own restricted access (limited entry) programs or enacted management restrictions that have affected participation in groundfish fisheries. In addition, the individual states may impose landing restrictions and limits that are more restrictive than federal restrictions or limits. XXX(Appendix A to this EA contains additional information on state regulations and licensing restrictions that affect the open access fishery participants.)XXX

The OA fisheries are generally distributed along the coast in patterns governed by factors such as location of target species and ports with supporting marine supplies and services, and restrictions or regulations imposed by state and federal governments. The commercial OA groundfish fishery consists of vessels that do not necessarily depend on revenue from the sale of groundfish as their a major source of income. The fishery is split between vessels targeting groundfish (*directed OA fishery vessels*) and vessels targeting other species but landing groundfish that was caught incidentally while targeting a nongroundfish species (*incidental OA fishery vessels*). However, it's difficult to segregate vessels into these two categories because the choice depends on the intention of the fisher. Over the course of a year or during a single trip, a fisher may engage in different strategies and may switch between directed and incidental fishing categories. Such changes in strategy are likely the result of a variety of factors, including the potential economic return from landing a particular mix of species.

The incidental catch of groundfish occurs in the Pacific halibut, California halibut, Dungeness crab, prawn, sheephead, sea cucumber, pink shrimp, salmon, HMS, and CPS fisheries. The majority of incidental fishery landings by the directed groundfish fishery, by weight, occur off California, while Oregon shows the next

highest landings, followed by Washington. In the incidental groundfish fisheries, Washington has the lowest groundfish landings, by weight (Hastie 2001). When considering both the directed and incidental OA fisheries, the variety of gears and the number of participating vessels is very large. Table 3.3.3.1. shows the number of directed and incidental OA vessels by fishery, the weight of groundfish landed, and the exvessel value of that catch for the years 2000-2004. The total number of vessels in each incidental fishery (those landing groundfish plus those that do not) are also shown.

Table 3.3.3.1. Open Access groundfish landings by fishery and gear group, 2000-2004 (PacFin)

Open access gear group	Number of vessels landing groundfish (total number of vessels)	Landed weight of groundfish (mt)	Exvessel revenue from groundfish ($)	Average per vessels exvessel revenue from groundfish ($)
Longline -groundfish directed a/	305	410	1,818,898	6,003
2000	324	398	1,690,165	5,217
2001	263	352	1,370,175	5,210
2002	296	479	1,730,461	5,846
2003	222	444	1,411,191	6,357
2004				
5-year average	*282*	*417*	*1,604,178*	*5,726*
Longline - Pacific Halibut directed				
2000	39 (61)	2.2	8,915	229
2001	35 (70)	1.9	5,956	170
2002	42 (73)	2.5	7,288	174
2003	38 (63)	4.9	21,694	571
2004	34 (59)	9.2	28,920	851
5-year average	*38 (65)*	*4.1*	*14,555*	399
Longline - CA Halibut directed				
2000	5 (10)	0.2	501	100
2001	1 (8)	c	c	0
2002	2 (14)	c	c	0
2003	2 (6)	c	c	0
2004	2 (7)	c	c	0
5-year average	2 (9)	c	c	20
Pot - groundfish directed a/				
2000	154	183	987,706	6,414
2001	140	182	986,069	7,043
2002	139	183	984,756	7,085
2003	149	186	997,578	6,695
2004	143	183	987,646	6,907
5-year average	*145*	*183*	*988,751*	*6,829*
Pot - Dungeness crab directed				
2000	33 (792)	0.6	2,112	64
2001	25 (781)	0.2	744	30
2002	23 (783)	0.3	1,143	50
2003	17 (816)	0.3	868	51
2004	6 (835)	0.2	652	109
5-year average	*21 (801)*	*0.3*	*1,104*	*61*
Pot - prawn directed				
2000	9 (36)	c	225	25
2001	7 (37)	0.3	1,408	201
2002	4 (27)	0.3	2,435	609
2003	6 (20)	0.1	677	113
2004	3 (21)	c	c	0
5-year average	*6 (28)*	*0.1*	*949*	*190*
Pot - sheephead directed				
2000	21 (103)	2.0	20,676	985
2001	26 (81)	3.8	37,496	1,442
2002	28 (74)	0.7	5,747	205
2003	14 (50)	0.3	1,784	127
2004	16 (32)	0.8	7,088	443
5-year average	*21 (68)*	*1.5*	*14,558*	*640*

Table 3.3.3.1. Continued

Open access gear group	Number of vessels landing groundfish (total number of vessels)	Landed weight of groundfish (mt)	Exvessel Revenue from groundfish ($)	Average per vessels exvessel revenue from groundfish ($)
Trawl - sea cucumber directed				
2000	0 (16)	c	c	c
2001	2 (13)	c	c	c
2002	2 (14)	c	c	c
2003	1 (14)	c	c	c
2004	1 (13)	c	c	c
5-year average	*2 (14)*	*c*	*c*	*c*
Trawl - CA halibut directed				
2000	22 (42)	2.4	5,449	248
2001	33 (46)	5.9	10,505	318
2002	29 (49)	6.0	13,018	449
2003	17 (42)	1.0	1,886	111
2004	13 (19)	12.3	35,637	2,741
5-year average	*23 (40)*	*5.5*	*13,299*	*773*
Trawl - spot prawn directed				
2000	10 (25)	0.6	1,065	107
2001	9 (24)	0.5	1,038	115
2002	9 (25)	0.6	1,198	133
2003	1 (6)	c	48	48
2004	0 (4)	0.0	0	0
5-year average	*7 (17)*	0.4	837	*81*
Trawl -Ridgeback Prawn directed	22 (35)	5.1	8,939	406
2000	16 (23)	3.9	6,182	386
2001	12 (25)	0.8	767	64
2002	12 (23)	1.6	2,072	173
2003	5 (11)	0.4	564	113
2004				
5-year average	*13 (23)*	*2.4*	*3,705*	*228*
Trawl -Pink Shrimp directed				
2000	62 (67)	142	203,664	3,285
2001	51 (62	89	129,326	2,536
2002	44 (53)	45	61,359	1,395
2003	6 (44)	1	817	136
2004	4 (43)	0	74	19
5-year average	*33 (54)*	*55*	*79,048*	*1,474*
Line gear - all groundfish a/				
2000	760	462	2,461,956	3,239
2001	635	501	2,545,790	4,009
2002	576	522	2,735,646	4,749
2003	501	404	1,963,033	3,918
2004	476	457	2,503,500	5,259
5-year average	*590*	*469*	*2,441,985*	*4,235*
Line gear - CA halibut				
2000	69 (230)	1.4	4,716	68
2001	69 (237)	1.4	5,985	87
2002	58 (231)	1.1	3,674	63
2003	47 (259)	1.5	6,254	133
2004	45 (240)	2.0	7,742	172
5-year average	*58 (239)*	1.5	*5,674*	*105*

Table 3.3.3.1. Continued

Open access gear group	Number of vessels landing groundfish (total number of vessels)	Landed weight of groundfish (mt)	Exvessel Revenue from groundfish ($)	Average per vessels exvessel revenue from groundfish ($)
Line gear - Salmon troll (coastwide)				
2000	281 (1,076)	15	26,073	93
2001	243 (1,058)	11	17,960	74
2002	207 (1,085)	7	12,707	61
2003	202 (1,043)	6	11,053	55
2004	237 (1,234)	11	19,816	84
5-year average	*234 (1,099)*	*10*	*17,522*	*73*
Line gear - Salmon troll (north only)				
2000	212	14	23,654	112
2001	228	9	15,158	66
2002	148	8	12,374	84
2003	134	4	7,574	57
2004	157	7	13,046	83
5-year average	*176*	*8*	*14,361*	*82*
Line gear - HMS				
2000	18 (220)	0.4	1,319	73
2001	12 (238	0.3	1,102	92
2002	7 (211)	0.3	652	93
2003	5 (187)	0.1	396	79
2004	6 (145)	0.1	236	39
5-year average	*10 (200)*	*0.2*	*741*	*75*
Net gear - HMS				
2000	33 (193)	1.5	2,099	64
2001	27 (167)	1.3	2,329	86
2002	26 (129)	1.6	3,200	123
2003	20 (123)	--	22	1
2004	19 (103)	1.1	2,577	136
5-year average	*25 (143)*	*1.1*	*2,045*	*82*
Net gear - CA halibut				
2000	64 (84)	20	28,902	452
2001	54 (63)	16	25,862	479
2002	43 (61)	11	19,137	445
2003	38 (51)	6	9,743	256
2004	35 (51)	4	7,450	213
5-year average	*47 (62)*	*11*	*18,219*	*389*

a/ Directed groundfish vessels are those vessels with any landing exceeding 50% of the revenue on a fish ticket

Table 3.3.3.2. Historical harvests for the open access fishery, 2000-2004 (PacFin)

Year	Groundfish round weight (mt)	Groundfish exvessel value ($)	Non-groundfish round weight (mt)	Non-groundfish exvessel value ($)	Total round weight (mt)	Total exvessel value ($)
2000	1,226	5,552,214	22,217	71,515,893	23,443	77,068,107
2001	1,200	5,439,726	24,297	61,777,567	25,497	67,217,293
2002	1,122	5,200,565	31,177	70,224,642	32,298	75,425,207
2003	1,086	4,738,621	40,900	114,672,760	41,986	119,411,381
2004	1,120	5,003,066	32,841	107,797,057	33,961	112,800,123

Many OA vessels predominately fish for non-groundfish species and inadvertently catch and land groundfish. In times and areas when fisheries for other species are not as profitable, some vessels will transition into the groundfish OA fishery for short periods. When landings and revenue are measured, the OA fishery is more expansive south of 40˚ 10' N lat. OA fishers in the south earned more per pound for their landed groundfish catch, reflecting the more lucrative live fish markets, among other things, in that region. Table 3.3.3.2 shows the historical harvests (landings) of groundfish and non-groundfish by OA vessels. In 2003, the first complete year in which coastwide RCAs were implemented, the round weight of nongroundfish landed increased over previous years while landings of groundfish species decreased slightly.

Because incidental vessels do not necessarily depend on their revenue from the groundfish fishery as their major source of income, understanding the level of dependency that such participants have on the OA groundfish fishery must be considered in light of their overall fisheries revenues. Table 3.3.3.3 shows the number of OA vessels by vessel length and level of dependency on the groundfish fishery (proportion of annual revenue that is from groundfish). Table 3.3.3.4 shows the number of OA vessels by level of dependency based on gross income for all West Coast landings. Between November 2000 and October 2001, 1,287 vessels landed groundfish in the OA sector of the groundfish fishery. Of these vessels, 771 vessels (60%) had a greater than 5% dependency on the groundfish fishery with 345 of these vessels having a 95-100% level of dependency of groundfish. The OA fishery is dominated by vessels under 40 feet in length. About 78 percent of the vessels that landed OA groundfish between November 2000 and October 2001 were less than 40 feet on length. It is assumed that a portion of these smaller vessels fish exclusively in state waters, and thus would be excluded from the VMS alternatives presented in this EA. However, the data are not available to identify the proportion of vessels that fish only in state waters. Approximately 36 percent of the OA vessels had a greater than 65 percent dependency on groundfish, with 56 percent of the most dependent vessels having less than $5,000 in gross fishing income. A greater proportion of vessels with lower levels of dependency on groundfish fell within income categories greater than $5,000. However, increases in higher valued groundfish catch in 2003 may reduce the proportion of OA vessels in the lowest (<$5,000) income category.

Table 3.3.3.3 Number of open access vessels by level of dependency and vessel length (based on data from November 2000 - October 2001) a/

	<40'	40'-50'	50'-60'	60'-70'	70'-150'	Unspecified	Total
<5%	324	109	29	28	25	1	516
>5% & <35%	154	32	6	4	1	0	197
>35% & <65%	96	8	1	0	0	0	105
>65% & <95%	115	5	0	0	1	3	124
>95% & <100%	310	21	5	2	0	7	345

Extracted from table 6-18a DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery
a/ OA vessels with more than half of their total landings value coming from groundfish are considered to be in the directed fishery

Table 3.3.3.4 Number of open access vessels by gross income levels of dependency for all West Coast landings (based on data from November 2000 - October 2001) a/

	Exvessel revenue from West Coast landings				
	<5,000	$5,000-$50,000	$50,000-$200,000	>$200,000	Total
<5%	45	268	169	34	516
>5% &<35%	52	101	44	0	197
>35% &<65%	47	50	8	0	105
>65% &<95%	63	55	6	0	124
>95% &<100%	200	138	7	0	345

Extracted from table 6-17a DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery
a/ open access vessels with more than half of their total landings value coming from groundfish are considered to be in the directed fishery

Historically, most of the OA fishing activity has occurred in the nearshore and shelf areas. As a result, bocaccio, canary rockfish, lingcod, yelloweye rockfish, and cowcod have been encountered more frequently than the other overfished species. Deeper slope species such as darkblotched rockfish and POP, and pelagic shelf species such as widow rockfish, are more vulnerable to trawl gear, and have been taken in smaller proportions in the OA fishery. With the exception of the pink shrimp trawl fishery, the OA trawl fisheries using nongroundfish trawl gear have historically landed few slope species.

Since 2003, total catch (retained plus discard) of overfished species taken in the OA sectors of the groundfish fishery has been projected before the start of each fishing year. The overfished species catch projections are used to determine if the proposed management measures are adequate to keep the total catch of overfished species within the sector harvest guidelines and allocations and within the OY specified for rebuilding. As the fishing year progresses, the Council reviews and revises management measures. The projected catch values for the open access sectors of the 2005 groundfish fishery are presented in Table 3.3.3.5.

When the total catch of overfished species projected to be taken by the OA groundfish fishery is considered in relation to the available OY for each overfished species, only canary rockfish is projected to exceed 10% of the

available OY(10.26%). Less than 5% of the available OY is projected to be taken of the remaining overfished species: 4.32% of the lingcod OY, 2.31% of the yelloweye rockfish OY, 3.88% of the bocaccio OY, 2.38% of the cowcod OY, 0.18% of the widow rockfish OY, 0.07% of the darkblotched OY, and 0.02% of the POP OY. With the exception of widow and yelloweye rockfish, the majority of the overfished species projected to be taken in 2005 will be taken in the directed OA fisheries.

When considering the impacts of an incidental fishery on overfished species, the HMS net and line fisheries, the California sheephead pot fishery, the sea cucumber trawl fishery and the spot prawn trap fishery have historically landed the lowest amounts of overfished species (Tables 3.3.3.6 and 3.3.3.7) before RCA management was adopted. These fisheries are also projected to have the lowest fishing mortality in 2005 with RCA management (Table 3.3.3.5). With the exception of sea cucumber trawl, fishing for the target species occurs within the RCAs, although only groundfish on trips where no fishing occurs in the RCA may be retained. The fisheries with slightly greater impacts on overfished species, those where small amounts by weight and proportion of the available OY (less than 0.05%), were taken included the ridgeback prawn trawl fishery and the Dungeness crab pot fishery. The Dungeness crab fishery occurs within the RCAs and has historically landed only small amounts of overfished species. While the ridgeback prawn trawl fishery has BRD requirements to reduce the catch of finfish, including overfished species, and has RCA restrictions. In 1998, prior to the implementation of conservation areas and the BRD requirements, the prawn fisheries (all prawns) landed 0.7 mt of lingcod, 0.05 mt of darkbloched rockfish, 2.4 mt of bocaccio, 0.05 mt of canary rockfish, 1.2 mt of cowcod, and 0.05 mt of yelloweye rockfish (Table 3.3.3.7). Although the California gillnet fishery is projected to take a single overfished species, it is projected to have a greater impact with 0.5 mt of bocaccio by weight or 0.16% of the OY being taken.

Those incidental fisheries with the greatest impacts on overfished species are salmon troll, pink shrimp trawl, Pacific halibut longline and California halibut (overfished species impacts not provided by gear type). The salmon troll fishery is projected to take 0.7% of the bocaccio OY, 3.43% of the canary rockfish OY, 0.01% of the lingcod OY, 0.11% of the widow rockfish OY, and 0.77% of the yelloweye rockfish OY. The salmon troll fishery, which occurs primarily on the shelf and within the RCA, has been allowed small incidental catches of Pacific halibut and groundfish, including yellowtail rockfish. Historical data show that salmon troll trips that did not land halibut had a higher range of groundfish landings (11-149 mt) than troll trips that landed halibut (1-19 mt). However, looking at groundfish catch frequency, either by vessel or trips, reveals that groundfish are caught more often by vessels or on trips catching halibut (Amendment 16-3, July 2004).

The overfished species impacts from the pink shrimp fishery, which is allowed to occur within the RCA because finfish excluders are required, are 0.03% of the bocaccio OY, 0.21% of the canary rockfish OY, 0.02% of the lingcod OY, 0.04% of the widow rockfish OY, and 0.38% of the yelloweye rockfish OY. The overfished species impacts projected for the Pacific halibut fishery are 0.04% of the lingcod OY. The overfished species impacts projected for the California halibut fishery are 0.03% of the bocaccio OY, 0.21% of the canary rockfish OY, and 0.08% of the lingcod OY.

Table 3.3.3.5 Total catch projections of overfished species in the 2005 open access fisheries. (9/1/2005 GMT's best estimates of total mortality)

	2005 bycatch projections (mt)							
	Bocaccio	Canary Rockfish	Cowcod	Darkblotched Rockfish	Lingcod	Pop	Widow	Yelloweye
Groundfish directed	10.6	3.0	0.1	0.2	100.0	0.1	0.1	0.3
California Halibut	0.1	0.1		0.0	2.0	0.0		
California Gillnet a/	0.5			0.0		0.0	0.0	
California Sheephead a/				0.0	0.0	0.0	0.0	0.0
CPS wetfish a/	0.3							
CPS squid b/								
Dungeness crab	0.0		0.0	0.0	0.5	0.0		
HMS		0.0	0.0	0.0				
Pacific Halibut	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Pink Shrimp	0.1	0.1	0.0	0.0	0.5	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.3	0.0	0.3	0.2
Sea cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot prawn (trap)								
Total 2005 Projected catch	11.9	4.8	0.1	0.2	104.3	0.1	0.5	0.6
2005 total catch OY	307	46.8	4.2	269	2,414	447	285	26
Proportion of total catch OY	3.88%	10.26%	2.38%	0.07%	4.32%	0.02%	0.18%	2.31%

a/ Mortality estimates are not hard numbers; based on the GMT's best professional judgement.

b/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish. This suggests that total bocaccio was caught in trace amounts.

Tables 3.3.3.6 Round weight by species and target fishery 1998 -2002, North of Cape Mendocino (mt) (Amendment 16-2, December 2004)

1998								
	Lingcod	Darkblotched Rockfish	POP	Bocaccio	Canary Rockfish	Cowcod	Widow Rockfish	Yelloweye Rockfish
Pacific Halibut	1.4	--	0	--	0.3	--	0	--
CA Halibut	0	--	--	--	0	--	--	--
Salmon	3.1	0	0.1	--	2.2	--	0.3	--
Gillnet complex	--	--	--	--	--	--	--	--
HMS	0	--	--	--	--	--	--	--
Pink shrimp	6.4	--	5.9	0	10.5	--	4.4	--
Dungeness	0.1	--	--	--	--	--	--	--
Prawns	--	--	--	--	--	--	--	--
2000								
Pacific Halibut	2.6	--	--	--	0.2	--	0	--
Salmon	8.4	--	--	--	1.6	--	0.1	0.05
Gillnet complex	--	--	--	--	--	--	--	--
HMS	--	--	--	--	--	--	0.05	--
Pink shrimp	15.1	--	0.3	--	11.3	--	2.4	--
Dungeness	0.05	--	--	--	0.05	--	--	--
Sea cucumber	--	--	--	--	--	--	--	--
Prawns	--	--	--	--	--	--	--	--
2002								
Pacific Halibut	3.9	--	0	--	0.1	--	--	0.2
CA Halibut	0	--	--	--	--	--	--	--
Salmon	3.9	--	--	--	0.5	--	0	--
Gillnet complex	--	--	--	--	--	--	--	--
HMS	--	--	--	--	--	--	--	--
Pink shrimp	6.2	0.6	0.05	--	1.2	--	--	--
Dungeness	0	--	--	--	--	--	--	--
Prawns	--	--	--	--	--	--	--	--
all vessel LE and OA permitted are included - tables show potential of gear to take if fishing occurs in the RCAs								

Table 3.3.3.7 Round weight by species and target fishery 1998 - 2002, South of Cape Mendocino (mt) (Amendment 16-2, December 2004)

1998								
	Lingcod	Darkblotched Rockfish	POP	Bocaccio	Canary Rockfish	Cowcod	Widow Rockfish	Yelloweye Rockfish
Pacific halibut	0.05	--	--	--	--	--	--	--
CA halibut	1.6	--	--	0.05	0	--	0.2	--
Salmon	0.3	--	--	0.1	0.05	--	0	0
Gillnet complex	0.5	--	--	0.3	--	0	0	--
HMS	0	--	--	0	--	--	--	--
Pink shrimp	0	--	--	0	0.1	--	0.9	--
Dungeness	0.2	--	--	--	0	--	--	--
Sea cucumber	--	--	--	0	--	--	--	--
Prawns	0.7	0.05	--	2.4	0.05	1.2	--	0.05
CA Sheephead	0.3	--	--	0	--	0	--	--
2000								
CA halibut	0.1	0	--	0.05	0	--	--	--
Salmon	0.4	--	--	0.2	0.1	--	0	--
Gillnet complex	--	--	--	--	--	--	--	--
HMS	--	--	--	0.05	0	--	--	0
Pink shrimp	0	--	--	--	0	--	0	--
Dungeness	--	--	--	--	--	--	--	--
Sea cucumber	--	--	--	--	--	--	--	--
Prawns	0.3	--	--	0.1	0.05	0.1	0.05	--
CA sheephead	0.05	--	--	0	0	--	0	0
2002								
CA Halibut	0.8	--	--	0.05	--	--	0.1	--
Salmon	0.5	--	--	0	--	--	--	--
Gillnet complex	0.5	--	--	0.3	--	0	0	--
HMS	0.1	--	--	--	--	--	--	--
Pink shrimp	--	--	--	--	--	--	--	--
Dungeness	--	--	--	--	--	--	--	--
Sea cucumber	0	--	--	--	--	--	--	--
Prawns	0	--	--	0.05	0.05	--	--	--
CA sheephead	0.1	--	--	0	--	--	--	--

a/ all vessel LE and OA permitted are included
b/ includes all prawn trawl

Open Access Directed Fisheries Participation in the directed OA fishery segment varies between years. Participants may move into other, more profitable fisheries, or they may take time off from fishing, or they may quit fishing altogether. Directed OA fishers use various non-trawl gears to target particular groundfish species or species groups. Longline and hook-and-line gear are the most common OA gear types and are generally used to target sablefish, rockfish, and lingcod. Pot gear is used for targeting sablefish, thornyheads and rockfish. Though largely restricted from use in recent year and prohibited under current regulations, in the past in Southern and Central California setnet gear was used to target rockfish, including chilipepper, widow rockfish, bocaccio, yellowtail rockfish, and olive rockfish, and to a lesser extent vermillion rockfish. Table 3.3.3.1. above identified the number of OA directed vessels that landed groundfish and the total landed weight and exvessel revenue of the groundfish by gear group, for 2000-2004.

Within the directed OA fishery, fishers are further grouped into the “dead” and/or “live” fish fisheries. The terms dead and live fish fisheries refers to the state of the fish when it is landed. The dead fish fishery has historically been the most common way to land fish. In 2001, the dead fish fishery made up 80% of the directed OA landings. However, more recently, the high market value for live fish has encouraged increased landings in the live fish fishery. In 2001, 20% of fish landed (by weight, coastwide) by directed OA fishers was landed alive as compared to only 6% in 1996 (PFMC 2004).

In the live-fish fishery, groundfish are primarily caught with hook and line gear (rod-n-reel), with LE longline gear and with LE pot gear, and a variety of other hook gears (e.g. stick gear). The fish are kept alive in a seawater tank on board the vessel. California halibut and rockfish taken in gill and trammel nets have increasingly appeared in the live fish fishery (CDFG 2001). Live fish are sold at a premium price to food fish markets and restaurants, primarily in Asian communities in California. Only limited information exists on the distribution of effort by OA vessels. Because the OA sector has an increasingly large live-fish fishery component with nearshore species making up most of the live fish landings, effort located near shore likely accounts for most live fish landings.

In California, since 1995, hook and line gear for the live-fish fishery has been limited to a maximum of 150 hooks per vessel and 15 hooks per line within one mile of the mainline shore (CDFG 2001). Traps are limited to 50 per fisherman. In Washington, it is illegal to possess live bottom fish taken under a commercial fishing license. In Oregon, nearshore rockfish and species such as cabezon and greenling are the primary target of the live fish fishery. Sablefish and rockfish are also landed alive in Oregon. The Oregon live fish fishery occurs in waters of ten fathoms or less (18 m). Only legal gears are allowed to be used to catch nearshore live fish. In early 2002, an Oregon Developing Fisheries Permit was required for fishermen landing live fish species (e.g. Cabezon, greenling (except kelp greenling), brown, gopher, copper, black and yellow, kelp, vermilion, and grass rockfish (among others), buffalo sculpin, Irish lords, and many surfperch species). However, commercial fishing for food fish is prohibited in Oregon bays and estuaries and within 600 feet (183 m) seaward of any jetty.

The VMS actions proposed in this EA would not apply to vessels that only fish in state waters. Because data were not available to specifically identify vessels that only fish in state waters, the number of vessels shown in Table 3.3.3.1 include all vessels: those that operated only in state waters (0-3 nm from shore), those that operate only in federal waters (>3 nm from shore) and those that operate in both state and federal waters.

Table 3.3.3.8 shows the weight of OA landings by depth group (nearshore, shelf, pelagic, and slope), for each of the directed fisheries for the years 2000-2004. Although data were not available to specifically identify vessels that fish only in state waters, many of the vessels that land nearshore species, are assumed to fish only in state waters. The landings data in Table 3.3.3.8 shows that the majority (72%) of groundfish landings by directed OA line gear was from the nearshore group, followed by the shelf group (18%) between 2000 and 2004. Given the large proportion of nearshore landings, it could be assumed that many of the directed OA line gear vessels identified in table 3.3.3.1 do not fish in federal waters and would not trigger the VMS requirements.

The directed OA fisheries may also account for substantial amounts of bycatch (incidental catch which is not

landed), especially for overfished groundfish species. As a result of the large proportion of nearshore landings by line gear vessels, bocaccio, canary rockfish, lingcod, yelloweye rockfish, and cowcod would likely be encountered more frequently than the other overfished species. Because the majority of longline and pot directed OA groundfish fisheries land deeper slope species, they are more likely to interact with overfished species such as darkblotched rockfish and POP. However, because these deeper dwelling overfished species are more vulnerable to trawl gear, they have been taken in smaller proportions in the OA fishery.

Open Access Incidental Fisheries Groundfish species co-occur with other nongroundfish species. When fishing gear is used to target nongroundfish species it may also encounter groundfish. Fisheries targeting Pacific halibut, California halibut, Dungeness crab, spot prawn, ridgeback prawn, California Sheephead, sea cucumber, pink shrimp, salmon and HMS are allowed to land incidentally caught groundfish and are a component of the OA fishery referred to as the incidental OA fisheries. The mortality of groundfish, especially for overfished groundfish species ,varies substantially between the incidental fisheries. The interaction between the nongroundfish target species and overfished groundfish species depend on many variables, including: the geographical areas fished (nearshore, shelf, slope, pelagic); the level at which the target species co-occur with overfished species; the vulnerability of the overfished species to the type of gear that is used, and the selectivity of the gear. In addition, fishing mortality rates resulting from the fishing activity may vary considerably between the gears and fisheries. Historical state and federal landing allowances also affect the perception of what species are taken incidentially. The number of OA incidental vessels that landed groundfish and the total landed weight and exvessel revenue of the groundfish by gear group, for 2000-2004 were identified above in Table 3.3.3.1.

Yelloweye rockfish prefer rocky reef habitat on the continental shelf, and are most vulnerable to fixed gear fisheries that traditionally occurred on the shelf including the commercial line fisheries targeting sablefish, Pacific halibut, and dogfish. Groundfish are also caught in the Pacific halibut fishery. Rockfish and sablefish are commonly intercepted, as they are found in similar habitat to Pacific halibut and are easily caught with longline gear. There is a strong correlation between directed line fisheries that target Pacific halibut (both commercial and recreational) and bycatch of yelloweye rockfish. Therefore, for 2003 management, the Council used the depth-based results of the IPHC halibut survey data to infer the depth-based yelloweye bycatch implications in this fishery. Approximately 99.1% of the yelloweye rockfish catch and 7.7% of the commercial-sized Pacific halibut catch in the IPHC survey occurred in waters shallower than 100 fm. Therefore, the Council recommended restricting the commercial halibut fishery to waters deeper than 100 fm, which is the regulation formally adopted by the IPHC.

Pots or traps are used in the incidental OA fisheries that target Dungeness crab, prawns, and California sheephead. Pots can be designed to be selective in the pursuit of various species. They can be rigged to be size selective, and in some cases, species selective. Fish pots can also be size selective through various means including mesh size, circular escape rings or rectangular escape vents. There is a low mortality for bycatch of unwanted species and juvenile fish in a pot fishery. Bycatch species are generally kept alive in the pot until it is hauled and then can be released alive. Despite the selectivity of pot gear small amounts of overfished species are taken incidentially. Prior to RCA management, small amounts of lingcod and canary rockfish were landed in the Dungeness crab pot fishery, while small amounts of lingcod, darkblotched rockfish, bocaccio, canary rockfish, cowcod, widow rockfish and yelloweye rockfish were landed in the prawn fisheries (Table 3.3.3.6 and 3.3.3.7). In the Dungeness crab fishery black rockfish may also be pulled up in the pot. Although, groundfish are caught incidentally in Dungeness crab pots off Washington, Oregon, and California, but can only be landed in XXOregonXX and California ports.

California sheephead are shallow nearshore finfish found in the coastal waters of southern California and Mexico and are managed as part of the California nearshore fishery along with many nearshore rockfish species. Different species of nearshore fishes often occur in mixed groups, making it difficult to target individual species. A 1993 study by Marine Resources Division Department of Fish and Game State of California, found that 66% of the finfish captured during the day time trap sets were nontarget species. At night, 81% of the finfish captured were nontarget and 33% of all finfish were either injured or killed. Because of these significant findings, the potential for the live-fish trap fishery to negatively affect nontarget finfish

populations may be greater than projected. When compared to the nontarget finfish landings, (which did not include the incidental catch thrown directly overboard during trapping operations) by live-fish trappers who were primarily targeting California Sheephead, they made up 9% of the landed nontarget catch. (XXXMarine Resources Division Department of Fish and Game State of California September 1993, Live-Fish Trap Fishery in Southern California 1989- 1992 and Recommendations for Management, M. Palmer- Zwahlen, J. O´Brien, and L. Laughlin)

Lingcod, canary rockfish, and widow rockfish were the overfished species were encountered on the greatest number of open access trawl trips in which groundfish was the dominant catch in the northern OA fisheries (Table 3.3.3.6). In southern OA fisheries, lingcod and bocaccio were the overfished species most frequently encountered (Table 3.3.3.7). Deeper slope species, such as darkblotched rockfish and POP, are more vulnerable to LE trawl gear and have been taken in small proportions in the OA fishery.
The non-groundfish trawl fisheries (pink shrimp trawl, ridgeback prawn, sea cucumber, and California halibut directed) primarily operate and land nearshore and shelf groundfish species and are therefore less likely to interact with overfished slope species.

BRDs or Finfish Excluders in pink shrimp trawls are used to reduce mortality of overfished species in that fishery. In some years, prior to finfish excluder requirements, the pink shrimp trawl fishery has accounted for a significant share of canary rockfish incidental catch (Table 3.3.3.6 and Table 3.3.3.7). The pink shrimp trawl fishery is exempted from RCA boundaries because state-required bycatch excluders are believed to effectively reduce bycatch of overfished species. Ridgeback prawn trawls that operate south of Point Conception have used BRDs to avoid bocaccio, cowcod, canary rockfish, and yelloweye rockfish without overly compromising catch efficiency of ridgeback prawns. The ridgeback prawn fishery operates primarily between 35 fm and 90 fm, with an average fishing depth of 75 fm. Trawl logbook data show that 99% of ridgeback prawns are caught in depths of 101 fm or less. With traditional fishing grounds being in sandy habitats, the impact to the overfished rockfish stocks are reduced.

Most sea cucumber trawl effort is concentrated in southern California, and collection is by hand using scuba in northern California. Until 1997 about 75% of the annual catch was from the southern California sea cucumber trawl fishery. The dive fishery has increased substantially,and now accounts for 80% of the total harvest. For nongroundfish trawl vessels where the primary target species was sea cucumber, no overfished species catch was projected for 2005. Prior to the implementation of RCAs, less than 0.5 mt of all overfished species combined were landed by sea cucumber vessels in a given year (Table 3.3.3.6 and Table 3.3.3.7). California halibut, a state-managed species, is targeted with hook-and-line, setnets and trawl gear, all of which intercept groundfish. Gear specific estimates for the nongroundfish trawl vessels where the primary target species was California halibut were not available. Lingcod, bocaccio, canary rockfish and widow rockfish were historically landed by all California halibut gears combined (Table 3.3.3.6 and Table 3.3.3.7). The projections for 2005 are similar in composition (Table 3.3.3.5).

Hook-and-line gear refers to both stationary longlines (setlines) and mobile or trolled hook-and-line gear. The gear may extend vertically or horizontally, and be on-bottom or off-bottom. Fish harvested with hook-and-line gear typically have minimal physical damage from the gear itself. Hook and line gear can have substantially different applications and selectivity. Hook size and type can affect selectivity. The use of small hooks can increase selectivity for small-mouth fish (such as sand-dabs, a type of flatfish) and avoid larger-mouth rockfish. Also, barbless hooks are required in some (nongroundfish fisheries) to improve survival of fish that must be released.

Historically, groundfish catch has not been a significant component in salmon troll fisheries. However the fishery does encounter groundfish and historical landings data include lingcod, POP, bocaccio, canary rockfish, widow rockfish, and yelloweye rockfish. Table 3.3.3.5 shows that the greatest overfished species effect of salmon trolling on groundfish is on canary rockfish. Management measures aimed at protecting canary rockfish, which is often caught in association with yellowtail rockfish, include reduced catch opportunity for yellowtail rockfish. A 2001analysis indicated that the amount of canary rockfish taken with salmon troll gear was not highly correlated to the amount of yellowtail rockfish taken with salmon troll gear. Following these

findings NMFS implemented a yellowtail incidental catch limit specific to the salmon troll fishery north of 40˚10' N. latitude. The intent of this small trip limit was to help reduce discard of yellowtail rockfish in the salmon troll fishery, without providing an incentive to target yellowtail rockfish or to exacerbate the incidental catch of canary rockfish. In addition to the incidental catch of groundfish, there is an incidental catch of Pacific halibut in the salmon troll fishery. Historical data show that trips where no halibut are landed have a higher range of groundfish landings in comparison to trips where halibut was landed. However, looking at groundfish catch frequency, either by vessel or trips, reveals that groundfish are caught more often by vessels on trips catching halibut (Amendment 16-3 EIS, July 2004).

Albacore is an important HMS species caught with line gear, in terms of west coast landings, and is commonly caught with troll gear. The albacore troll fishery has little groundfish bycatch. Albacore are very sensitive to water temperature, and the low bycatch may be because few other species are found in the warmer surface waters.

Central California was an important area for the California halibut set gill net fishery during the 1980s. In the early 1990s, California's set gillnet fishery was subject to increasingly restrictive state regulations that forced the fleet into deeper water where shelf rockfish became their primary target. However, as open access rockfish limits became smaller, there was a shift from targeting shelf rockfish with setnets to the use of line gear in the nearshore live-fish fishery. (Amendment 16-2 EIS, December 2003) Gill nets are single-walled nets made of nylon or monofilament which are hung without slack to catch species such as white croaker and rockfish that gill in the nets. When gill nets are fished for California halibut, fishermen attach suspenders to the nets to create slack in the net so the halibut entangle or roll up in the nets, rather than being caught by their gills (XXXCalifornia Department of Fish and Game Marine Region Biological Opinion prepared for Director Robert C. Hight Assessment of Management Alternatives for Protecting Marine Mammals and Birds in the Central Coast Set Gill Net Fishery Compiled by Paul N. Reilly, Senior Marine Biologist September 8, 2000XXX). Because of the large mesh (8.5 inch) used in halibut gill nets and because the nets are fished in soft bottom areas, they are not projected to take significant numbers of rockfish. Overfished species found in association with California halibut are bocaccio, canary rockfish and widow rockfish. HMS Drift gillnet observer data shows that pelagic groundfish species such as whiting, spiny dogfish, and yellowtail rockfish are most frequently caught.

The weight of OA landings by depth group (nearshore, shelf, pelagic, and slope) are shown in Table 3.3.3.8 for each of the incidental groundfish fisheries for the years 2000-2004. The weight of groundfish landed in the incidental OA fisheries varies both between vessels within a target fishery and between fisheries. Table 3.3.3.9 groups vessels into weight categories (less than 100 lb per year, 101-500 lb per year, 500-1000 lb per year, and more than 1000 lbs per year) based on the annual weight of groundfish landed between 2000-2004. This information identifies the number of vessels that are landing the smallest amounts of groundfish. The vessels in the smallest groups (less than 100 lb, 101-500) likely represent trips in which groundfish is being avoided when harvesting the nongroundfish target species, or trips for nongroundfish targets that have a lower co-occurrence rate with groundfish. The incidental fisheries where the vast majority of vessels land less that 500 lb of groundfish per year are: Pacific halibut prior to 2004, California halibut longline, Dungeness crab pot, sheephead pot, sea cucumber trawl, ridgeback prawn trawl in 2004, pink shrimp trawl in 2003 and 2004, California halibut line gear, salmon troll, and HMS line gear. The fisheries where a substantial proportion of vessels land more than 500 lb of groundfish per year include: spot prawn pot, California halibut trawl, Pacific halibut longline in 2004, and ridgeback prawn trawl prior to 2004. Table 3.3.3.10**.** presents similar information, however, in this table vessels are grouped by month and the unique number of vessel that exceed the threshold for the monthly weight category is also presented. The weight categories for landed groundfish in table 3.3.3.10 are: less than 100lb per month, 101-200 lb per month, and greater than 200 lb per month.

Table 3.3.3.8. Open access directed and incidental fisheries, weight of groundfish landings by depth group 2000-2004 (PacFin)

OA gear group & weight of groundfish landed	Weight of landed catch by all vessels mt a/			
	Nearshore	Pelagic	Shelf	Slope
Longline -groundfish directed				
2000	88	1	23	294
2001	84	6	27	279
2002	55	0	21	276
2003	33	0	55	390
2004	27	1	96	319
5-year average	57	*1*	*44*	*312*
Longline - Pacific Halibut directed				
2000	--	--	0.7	1.8
2001	--	--	3.1	2.3
2002	--	--	0.9	2.0
2003	--	--	0.9	5.4
2004	--	--	1.5	8.8
5-year average	--	--	*1.4*	*4.0*
Longline -CA halibut directed b/				
2000	0.1	--	0.1	--
2001	--	--	c	--
2002	--	--	c	--
2003	--	--	c	--
2004	--	--	c	--
5-year average	--	--	--	--
Pot -groundfish directed				
2000	57	c	1	124
2001	39	--	2	113
2002	29	--	2	104
2003	27	c	4	179
2004	19	--	3	179
5-year average	*34*	--	*3*	*140*
Pot - Dungeness crab directed				
2000	0.5	c	0.1	0.1
2001	0.2	c	c	0.1
2002	0.4	--	c	0.1
2003	0.1	--	c	0.6
2004	0.3	--	c	0.2
5-year average	*0.3*	--	--	*0.2*

Table 3.3.3.8. Continued

OA gear group & weight of groundfish landed	Weight of landed catch by all vessels mt a/			
	Nearshore	Pelagic	Shelf	Slope
Pot - spot prawn directed				
2000	0.3	--	c	c
2001	0.3	--	c	1.3
2002	c	1.0	2.0	3.0
2003	0.2	--	c	1.0
2004	0.2	--	c	c
5-year average	*0.2*	*0.2*	*0.4*	*1.1*
Pot - sheephead directed				
2000	2.1	--	c	c
2001	3.5	--	0.5	0.2
2002	0.7	--	0.2	0.1
2003	0.5	--	0.2	c
2004	1.2	--	0.3	c
5-year average	*1.6*	--	*0.2*	*0.1*
Trawl - sea cucumber directed				
2000	c	--	--	--
2001	--	--	--	--
2002	--	--	c	--
2003	--	--	c	c
2004	--	--	c	--
5-year average	--	--	--	--
Trawl - CA halibut directed				
2000	0	--	10	--
2001	1	--	8	--
2002	1	--	7	--
2003	c	--	2	--
2004	c	--	13	--
5-year average	--	--	*8*	--
Trawl - spot prawn directed				
2000	--	--	0.9	--
2001	c	--	0.6	0.1
2002	c	--	0.4	--
2003	--	--	--	--
2004	--	--	--	--
5-year average	--	--	*0.5*	–

Table 3.3.3.8. Continued

OA gear group & weight of groundfish landed	Weight of landed catch by all vessels mt a/			
	Nearshore	Pelagic	Shelf	Slope
Trawl -Ridgeback Prawn directed				
2000	0.7	c	4.8	0.1
2001	0.3	c	7.0	c
2002	0.3	--	2.8	c
2003	c	0.1	2.8	--
2004	0.1	--	0.7	--
5-year average	*0.3*	--	*3.6*	--
Trawl -Pink Shrimp directed				
2000	c	58	51	36
2001	c	47	24	19
2002	--	21	16	9
2003	--	c	1	c
2004	--	c	2	c
5-year average	--	*25*	*19*	*13*
Line gear - groundfish directed b/				
2000	312	14	96	24
2001	384	3	88	24
2002	392	3	81	46
2003	266	2	66	69
2004	320	3	91	41
5-year average	*337*	*5*	*84*	*41*
Line gear - CA halibut				
2000	0.7	c	0.6	c
2001	0.6	c	0.7	c
2002	0.2	c	0.8	c
2003	0.3	--	1.5	--
2004	0.4	c	1.7	c
5-year average	*0.4*	--	*1.1*	--
Line gear - Salmon troll (coastwide)				
2000	2.0	2.3	9.2	0.1
2001	0.8	3.7	6.5	0.2
2002	0.9	2.3	2.9	0.6
2003	0.4	3.3	2.4	0.2
2004	0.7	6.9	3.6	0.1
5-year average	*1.0*	*3.7*	*4.9*	*0.2*

Table 3.3.3.8. Continued

OA gear group & weight of groundfish landed	Weight of landed catch by all vessels mt a/			
	Nearshore	Pelagic	Shelf	Slope
Line gear - HMS b/				
2000	c	0.1	0.2	--
2001	0.1	c	0.2	c
2002	c	--	0.1	--
2003	0.1	--	0.1	0.4
2004	c	--	0.1	0.2
5-year average	--	--	*0.1*	*0.1*
Net gear - HMS b/				
2000	--	--	--	--
2001	--	--	0.1	--
2002	--	--	0.1	--
2003	--	--	0.1	--
2004	--	--	0.1	--
5-year average	--	--	0.1	--
Net gear - CA halibut b/				
2000	1.3	0	7.6	0.1
2001	1.2	c	5.5	0
2002	0.6	0	3.6	c
2003	0.1	0	1.8	c
2004	0.3	c	1.3	0
5-year average	*0.7*	–	*4.0*	--

a/ very small amounts landed
b/ unknown species of groundfish appeared for longline CA halibut, hook and line groundfish directed and hook and line HMS directed. These values are not included in this table.

Table 3.3.3.9. OA groundfish vessels by annual weigh of groundfish landed, 2000-2004 (PacFin)

Open access gear group & weight of groundfish landed	Number of Vessels (weight of landed catch by all vessels lb)				
	2000	2001	2002	2003	2004
Longline - Pacific Halibut directed					
<100 lb	20 (931)	17 (563)	24 (1,212)	14 (561)	2 (89)
101-500 lb	19 (4,641)	14 (3,293)	15 (3,293)	14 (3,401)	15 (4,457)
501-1,000	--	3 (2,115)	3 (1,920	6 (4,349)	10 (7,538)
>1,000	--	1 (8,629)	--	4 (5,522)	7 (10,701)
Longline -CA halibut directed					
<100 lb	4 (168)	1 (61)	2 (70)	2 (63)	2 (11)
101-500 lb	1 (352)	0	0	0	0
Pot - Dungeness crab directed					
<100 lb	30 (822)	23 (313)	21 (440)	15 (368)	4 (50)
101-500 lb	3 (719)	2 (455)	1 (201)	1 (348)	1 (322)
501 -1,000 lb			1 (606)	1 (944)	1 (669)
Pot - spot prawn directed					
<100 lb	7 (100)	2 (111)	--	2 (29)	2 (103)
101-500 lb	1 (481)	4 (1,093)	3 (579)	3 (392)	--
501-1,000 lb	1 (520)	--	--	--	1 (650)
>1,000 lb		4 (2,585)	1 (1,253)	1 (2,289)	–
Pot - sheephead directed					
<100 lb	15 (494)	17 (457)	21 (568)	11 (461)	8 (244)
101-500 lb	4 (588)	5 (1,147)	6 (1,285)	2 (540)	7 (1,544)
501-1,000 lb	--	1 (522)	1 (582)	1 (504)	--
>1,000 lb	2 (3,820)	3 (7478)	--	--	1 (1,694)
Trawl - sea cucumber directed					
<100 lb	--	2	2	1	1
Trawl - CA halibut directed					
<100 lb	7 (209)	13 (471)	11 (333)	11 (586)	2 (11)
101-500 lb	6 (1,559)	6 (1,876)	8 (1,743)	4 (1,000)	4 (923)
501-1,000 lb	4 (2,250)	6 (4,807)	6 (4,807)	1 (604)	1 (783)
>1,000 lb	6 (19,718)	8 (16,904)	4 (12,895)	1 (2,393)	6 (27,955)
Trawl - spot prawn directed					
<100 lb	4 (170)	5 (212)	5 (284)	1 (48)	--
101-500 lb	5 (1,164)	2 (402)	4 (965)	--	--
501-1,000 lb	--	--	--	--	--
>1,000 lb	1 (1,244)	2 (1,207)	--	--	–

Table 3.3.3.9. Continued

Open access gear group & weight of groundfish landed	Number of Vessels (weight of landed catch by all vessels lb)				
	2000	2001	2002	2003	2004
Trawl -Ridgeback Prawn directed					
<100 lb	7 (315)	3 (99)	5 (160)	3 (169)	2 (55)
101-500 lb	4 (654)	3 (615)	3 (610)	4 (1,018)	1 (104)
501-1,000 lb	4 (2,839)	5 (3,834)	2 (1,851)	3 (2,269)	2 (1,557)
>1,000 lb	7 (10,443)	5 (11,995)	2 (4,330)	2 (3,013)	
Trawl -Pink Shrimp directed					
<100 lb	6 (276)	7 (347)	3 (164)	2 (74)	2 (21)
101-500 lb	7 (1,871)	3 (867)	6 (1,545)	2 (512)	1 (120)
501-1,000 lb	3 (2,241)	1 (894)	9 (6,767)	1 (706)	--
>1,000 lb	46 (317,748)	40 (195,835)	26 (91,796)	1 (1,643)	1 (3,728)
Line gear - CA halibut					
<100 lb	63 (2,299)	61 (1,500)	52 (1,170)	33 (777)	29 (796)
101-500 lb	6 (1,121)	8 (1,661)	6 (1,221)	13 (2,619)	16 (3,951)
501-1000 lb	--	--	--	1 (681)	–
Line gear - Salmon troll (coastwide)					
<100 lb	187 (6,232)	177 (5,808)	168 (5,504)	162 (4,758)	159 (5,866)
101-500 lb	83 (18,905)	55 (11,398)	36 (6,714)	36 (6,818)	75 (17,196)
501-1,000 lb	11 (6,854)	10 (6,486)	2 (1,514)	4 (2,448)	3 (1,942)
>1,000 lb	--	1 (1,221)	1 (1,115)	--	--
Line gear - Pacific Halibut					
<100 lb	--	--	--	1 (8)	1 (97)
Line gear - HMS					
<100 lb	17 (739)	9 (275)	6 (216)	2 (73)	4 (106)
101-500 lb	1 (120)	3 (389)	1 (366)	2 (293)	1 (143)
501-1,000 lb				1 (924)1	1 (536)

a/ multiple records exist for landings with HKL gear that do not have an associated vessel id. The vessel count in this case is an estimate
b/ annual revenue of $2,500 is used as a proxy for vessels that had efforts directed at groundfish
c\ if ≥20% of revenue was from groundfish, a vessel was assumed to have target groundfish at some point during the year

Table 3.3.3.10. Number of incidental OA vessels landing category and month, 2000 - 2004 (PacFin)

OA gear group & weight of groundfish landed	Number of Vessels (weight of landed catch by all vessels lb)												Unique vessels
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Longline - Pac. Halibut													
2000													
<100 lb	--	--	--	--	--	--	29	--	--	--	--	--	29
101-200 lb	--	--	--	--	--	--	11	1	--	--	--	--	12
>200 lb	--	--	--	--	--	--	8	--	--	--	--	--	8
2001													
<100 lb	--	--	--	--	--	1	21	--	4	--	--	--	24
101-200 lb	--	--	--	--	--	2	8	--	1	--	--	--	10
>200 lb	--	--	--	--	--	--	10	--	3	--	--	--	10
2002													
<100 lb	--	--	--	--	--	20	20	--	--	--	--	--	34
101-200 lb	--	--	--	--	--	3	5	--	--	--	--	--	8
>200 lb	--	--	--	--	--	7	3	--	--	--	--	--	10
2003													
<100 lb	--	--	--	--	--	16	8	2	--	--	--	--	25
101-200 lb	--	--	--	--	--	4	9	3	--	--	--	--	13
>200 lb	--	--	--	--	--	2	8	10	--	--	--	--	14
2004													
<100 lb	--	--	--	--	--	11	8	1	--	--	--	--	17
101-200 lb	--	--	--	--	--	5	7	--	--	--	--	--	11
>200 lb	--	--	--	--	--	19	17	2	--	--	--	--	27
Longline -CA halibut													
2000													
<100 lb	1	2	1	2	1	1	1	1	--	1	--	--	5
101-200 lb	--	--	--	--	1	--	--	--	--	--	--	--	1
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2001													
<100 lb	--	--	--	--	--	--	1	--	--	--	--	1	1
101-200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2002													
<100 lb	--	1	--	1	--	--	1	--	--	--	--	--	2
101-200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2003													
<100 lb	--	1	--	--	--	1	--	--	--	--	--	--	2
101-200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2004													
<100 lb	--	--	--	--	--	1	--	--	--	--	--	--	1
101-200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
Pot - Dungeness crab													
2000													
<100 lb	3	1	5	15	9	8	5	1	--	--	1	7	32
101-200 lb	--	--	--	--	1	--	--	--	--	--	--	--	1
>200 lb	--	--	--	1	--	--	--	--	--	--	--	--	1
2001													
<100 lb	5	6	4	6	3	3	1	2	--	--	--	1	24
101-200 lb	--	--	1	--	--	--	--	--	--	--	--	--	1
>200 lb	--	--	--	1	--	--	--	--	--	--	--	--	1
2002													
<100 lb	10	4	8	3	6	3	1	--	--	--	--	2	21
101-200 lb	--	--	--	1	--	--	--	--	--	--	--	--	1
>200 lb	--	--	--	--	--	1	--	--	--	--	--	--	1
2003													
<100 lb	6	5	3	4	4	2	1	--	--	--	--	1	15
101-200 lb	--	1	--	--	--	--	--	--	--	--	--	1	1
>200 lb	2	--	--	--	--	--	--	--	--	--	--	--	2
2004													
<100 lb	--	1	1	1	2	--	--	--	--	--	--	--	5
101-200 lb	--	1	1	--	--	--	--	--	--	--	--	--	2
>200 lb	1	--	--	--	--	--	--	--	--	--	--	--	1

Table 3.3.3.10. Continued

OA gear group & weight of groundfish landed	Number of Vessels (weight of landed catch by all vessels lb)												Unique vessels
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Pot - spot prawn													
2000													
<100 lb	4	1	1	1	1	2	1	2	2	2	1	--	9
101-200 lb	--	--	--	--	--	1	--	1	1	--	--	1	2
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2001													
<100 lb	--	1	3	--	3	3	3	2	3	2	1	1	7
101-200 lb	1	1	--	2	--	1	--	1	--	--	--	--	5
>200 lb	1	1	1	--	--	--	--	1	--	1	1	--	1
2002													
<100 lb	--	1	1	4	--	1	1	2	1	2	1	--	4
101-200 lb	--	--	--	--	--	1	--	1	1	--	--	--	3
>200 lb	1	1	--	--	--	--	--	--	1	--	--	--	1
2003													
<100 lb	--	1	--	--	2	--	--	1	1	--	--	--	4
101-200 lb	--	--	--	--	--	1	--	--	2	--	--	--	3
>200 lb	2	1	--	--	--	--	--	--	--	--	--	--	1
2004													
<100 lb	--	--	--	1	--	--	1	1	--	--	--	--	3
101-200 lb	--	--	--	--	--	--	--	--	2	--	--	--	1
>200 lb	--	--	--	--	–	1	–	–	–	–	–	–	1
Pot - sheephead													
2000													
<100 lb	2	2	7	7	7	11	6	4	7	2	1	2	21
101-200 lb	--	--	--	--	1	2	1	--	1	--	1	1	3
>200 lb	--	--	--	2	1	2	--	--	2	--	1	--	2
2001													
<100 lb	4	3	6	6	8	7	8	4	3	2	2	--	26
101-200 lb	--	--	1	--	1	2	2	5	1	1	--	--	3
>200 lb	--	--	--	3	3	1	3	1	3	--	--	--	10
2002													
<100 lb	--	--	8	6	8	8	5	8	--	--	--	--	26
101-200 lb	--	--	1	3	--	1	1	--	--	--	--	--	5
>200 lb	--	--	--	1	--	--	1	--	--	--	--	--	2
2003													
<100 lb	2	6	2	--	4	4	3	--	1	--	--	--	14
101-200 lb	--	--	--	--	3	1	1	--	--	--	--	--	2
>200 lb	--	--	--	--	1	--	--	--	--	--	--	--	1
2004													
<100 lb	--	1	8	6	6	9	7	8	2	1	--	--	16
101-200 lb	--	--	--	--	1	3	1	1	1	--	--	--	2
>200 lb	--	--	--	--	1	--	--	2	1	--	--	--	2
Trawl - CA halibut													
2000													
<100 lb	4	5	3	4	4	3	3	3	7	4	4	1	21
101-200 lb	2	--	2	5	2	2	3	3	2	1	--	--	9
>200 lb	6	2	3	8	3	10	6	4	1	2	--	1	13
2001													
<100 lb	3	8	7	4	9	7	1	3	6	5	12	7	29
101-200 lb	3	2	3	--	4	3	4	3	5	1	3	4	16
>200 lb	1	1	8	3	4	2	3	5	2	6	2	4	18
2002													
<100 lb	9	11	9	6	3	4	5	3	--	1	3	5	27
101-200 lb	6	10	2	4	2	6	2	--	1	--	--	2	14
>200 lb	3	6	9	8	8	4	--	--	--	--	--	1	9
2003													
<100 lb	8	2	4	5	8	3	2	3	1	3	1	--	17
101-200 lb	1	1	2	2	1	--	--	1	1	1	--	--	3
>200 lb	1	1	--	--	--	--	--	1	--	--	1	--	3
2004													
<100 lb	3	1	1	2	1	2	1	3	3	2	4	2	11
101-200 lb	1	1	2	--	--	--	3	4	2	--	1	5	9
>200 lb	2	--	1	1	2	5	9	4	3	2	3	5	8

Table 3.3.3.10. Continued

OA gear group & weight of groundfish landed	Number of Vessels (weight of landed catch by all vessels lb)												Unique vessels a/
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Trawl - spot prawn													
2000													
<100 lb	1	1	2	--	--	3	1	2	-	--	--	--	7
101-200 lb	--	2	--	1	1	2	1	2	1	--	--	--	4
>200 lb	--	--	--	--	1	1	--	--	1	--	--	--	3
2001													
<100 lb	--	1	3	2	3	2	1	1	1	--	--	--	7
101-200 lb	--	1	1	1	1	1	1	--	--	--	--	--	4
>200 lb	--	--	--	--	1	--	--	--	--	--	--	--	1
2002													
<100 lb	--	--	2	4	4	1	1	1	--	--	--	--	8
101-200 lb	--	--	--	2	--	1	--	--	--	--	--	--	3
>200 lb	--	--	--	1	--	--	--	--	--	--	--	--	1
2003													
<100 lb	--	--	--	1	--	--	--	--	--	--	--	--	1
101-200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2004													
<100 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
101-200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
Trawl -Ridgeback Prawn													
2000													
<100 lb	2	5	4	3	3	--	1	--	1	7	3	4	19
101-200 lb	3	1	1	4	5	--	--	--	--	2	3	5	11
>200 lb	--	--	5	7	3	--	--	--	--	--	7	5	7
2001													
<100 lb	3	3	4	4	2	--	1	1	--	3	1	1	13
101-200 lb	7	7	7	5	3	--	--	--	--	--	1	--	11
>200 lb	8	5	5	2	--	--	--	--	--	2	3	5	10
2002													
<100 lb	4	1	2	2	4	--	2	--	--	1	1	1	11
101-200 lb	2	4	1	1	1	--	--	--	--	--	--	--	6
>200 lb	3	1	5	3	3	--	--	--	--	--	--	--	5
2003													
<100 lb	3	3	2	5	2	--	--	--	--	7	5	--	11
101-200 lb	--	2	1	3	3	--	--	--	--	4	2	--	8
>200 lb	1	--	2	2	5	--	--	--	--	--	--	--	6
2004													
<100 lb	3	--	1	1	--	--	--	--	--	2	--	--	4
101-200 lb	1	1	--	--	--	--	--	--	--	1	1	--	2
>200 lb	--	--	--	--	--	--	--	--	--	1	1	1	2
Trawl -Pink Shrimp													
2000													
<100 lb	--	--	--	--	5	5	3	6	1	--	--	--	18
101-200 lb	--	--	--	--	3	3	3	2	--	2	--	--	11
>200 lb	--	--	--	2	8	43	49	37	37	27	--	--	54
2001													
<100 lb	--	--	--	4	4	5	2	5	4	8	--	--	26
101-200 lb	--	--	--	3	2	2	3	3	4	4	--	--	15
>200 lb	--	--	--	25	29	37	31	18	11	2	--	--	42
2002													
<100 lb	--	--	--	6	5	4	8	4	5	2	--	--	21
101-200 lb	--	--	--	4	1	2	2	2	1	2	--	--	10
>200 lb	--	--	--	13	35	28	4	4	2	1	--	--	38
2003													
<100 lb	--	--	--	2	2	1	1	1	--	1	--	--	4
101-200 lb	--	--	--	1	--	--	--	--	--	--	--	--	1
>200 lb	--	--	--	–	2	1	–	–	1	1	--	--	3
2004													
<100 lb	--	--	--	–	--	1	–	1	--	--	--	--	2
101-200 lb	--	--	--	–	1	--	–	--	--	--	--	--	1
>200 lb	--	--	--	–	1	1	1	1	–	–	--	--	1

Table 3.3.3.10. Continued

OA gear group & weight of groundfish landed	Number of Vessels (weight of landed catch by all vessels lb)												Unique vessels a/
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Line gear - CA halibut													
2000													
<100 lb	--	1	4	11	8	19	25	18	16	11	8	7	69
101-200 lb	--	--	--	--	--	--	–	2	--	--	--	--	2
>200 lb	--	--	--	--	--	--	1	--	--	--	--	--	1
2001													
<100 lb	5	3	3	5	10	10	14	27	12	16	4	3	67
101-200 lb	--	--	--	--	1	--	2	1	1	--	--	--	4
>200 lb	--	--	--	--	--	--	1	--	--	--	--	--	1
2002													
<100 lb	3	1	7	6	8	10	14	18	10	9	4	2	58
101-200 lb	--	--	--	--	--	--	1	1	2	--	--	--	3
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2003													
<100 lb	--	3	2	--	5	13	14	18	11	5	5	2	45
101-200 lb	--	--	--	--	--	--	1	4	2	1	--	--	1
>200 lb	--	--	--	--	--	--	--	2	--	--	--	--	2
2004													
<100 lb	--	--	3	6	6	10	16	17	15	9	--	--	44
101-200 lb	--	1	--	--	--	--	3	2	2	--	--	--	8
>200 lb	--	--	--	--	--	--	1	2	1	--	--	--	4
Line gear - Salmon troll (coastwide)													
2000													
<100 lb	--	--	--	21	74	95	114	61	54	26	6	2	253
101-200 lb	--	--	--	--	12	14	8	2	6	--	--	--	40
>200 lb	--	--	--	--	26	9	4	--	4	--	--	--	40
2001													
<100 lb	--	--	--	48	84	100	66	72	56	15	3	--	230
101-200 lb	--	--	--	2	12	11	3	11	2	--	--	--	34
>200 lb	--	--	--	1	9	7	--	5	2	--	--	--	19
2002													
<100 lb	--	--	18	43	85	48	42	39	28	14	6	1	191
101-200 lb	--	--	1	2	11	1	2	4	1	--	--	--	21
>200 lb	--	--	--	1	6	1	1	6	1	--	--	--	13
2003													
<100 lb	--	--	8	24	57	27	33	54	44	33	--	--	184
101-200 lb	--	--	--	3	6	2	4	4	6	4	--	--	24
>200 lb	--	--	--	--	2	2	4	5	5	--	--	--	12
2004													
<100 lb	--	--	22	37	83	72	41	52	35	12	--	--	209
101-200 lb	--	--	--	3	27	14	13	8	2	--	--	--	51
>200 lb	--	--	--	--	11	5	1	--	2	1	--	--	18
Line gear - HMS													
2000													
<100 lb	--	1	--	--	--	3	1	5	6	1	1	--	18
101-200 lb	--	--	--	--	--	--	--	--	--	1	1	--	1
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2001													
<100 lb	--	--	--	--	--	4	2	5	1	1	1	--	10
101-200 lb	--	--	--	--	--	--	--	1	--	1	1	--	2
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2002													
<100 lb	--	--	--	--	--	--	2	2	2	--	--	--	6
101-200 lb	--	--	--	--	--	--	--	--	--	--	--	--	1
>200 lb	--	--	--	--	--	--	--	--	--	--	--	--	--
2003													
<100 lb	--	--	--	--	--	1	1	1	1	--	--	--	3
101-200 lb	--	--	--	--	--	3	2	1	--	--	--	--	3
>200 lb	--	--	--	--	--	1	1	--	--	--	--	--	1
2004													
<100 lb	--	--	--	--	--	1	3	1	1	1	1	--	5
101-200 lb	--	--	--	--	--	1	1	1	--	--	--	--	2
>200 lb	--	--	--	--	--	--	--	--	1	--	--	--	1

a/ Values for unique vessels cannot be summed between weight categories

Dungeness Crab Fishery

The states of Oregon and California, and Washington in cooperation with the Washington Coast treaty tribes manage the Dungeness crab fishery. The Pacific States Marine Fisheries Commission (PSMFC) provides inter-state coordination. The Dungeness crab fishery is divided between treaty sectors, covering catches by Indian Tribes, and a non-treaty sector. This fishery is managed on the basis of simple "3-S" principles: sex, season, and size. The commercial fishery may retain only male crabs (thus protecting the reproductive potential of the populations); the fishery has open and closed seasons; and the commercial fishery must comply with a minimum size limit on male crabs.

Washington manages the Dungeness fishery with a LE system with two tiers of pot limits and a season from December 1 through September 15. In Oregon, 306 vessels made landings in 1999. The Oregon season generally starts on December 1. In California, distinct fisheries occur in Northern and Central California, with the northern fishery covering a larger area. California implemented a LE program in 1995, and as of March 2000 about 600 California residents and 70 non-residents hold LE permits. Nonetheless, effort has increased with the entry of larger multipurpose vessels from other fisheries. Landings have not declined. The effort increase has resulted in a "race for fish" with more than 80% of total landings made during the month of December.

Both personal use fishers and commercial fishers target Dungeness crab. At the commercial level, the Dungeness crab fishery generated $67 to $130 million in exvessel revenue (Table 3.3.3.11); in recent years (2002 and 2003) the amount of exvessel revenue generated by the fishery has been increasing due in part to increases in stock biomass. For many vessels, the Dungeness crab fishery has been the fishery with the largest exvessel revenues.

The majority of Dungeness crab fishing effort and catch occurs during the months of December and January. Many types of vessels participate in this fishery including vessels that may otherwise be LE groundfish trawlers and fixed gear vessels, as well as other types of vessels. The Dungeness crab fishery tends to occur in areas nearer to shore than the LE trawl and fixed gear fisheries. To avoid gear interactions with the Dungeness crab fishery, a conscious effort has been made to allow groundfish trawl vessels access to waters deeper than 60 fathoms during winter months.

All three states are comparable in terms of landed weight and revenue in coastal management areas, and Washington has an additional component in Puget Sound that is substantial. Washington had the highest landings recent years for coastal Dungeness crab, followed closely by Oregon and California. The ports with highest landings are distributed among the three states (Table 3.3.3.12).

Table 3.3.3.11. Landings and Exvessel Revenue of Dungeness Crab by Area, State, and Year (2000-2003)

			YEAR			
Area	State	Data type	2000	2001	2002	2003
Coastal Management Areas	CA	Landed weight (lbs)	6,482,913	3,546,106	7,297,676	22,196,754
		Exvessel revenue ($)	13,751,700	9,009,756	13,458,089	35,270,665
	OR	Landed weight (lbs)	11,180,845	9,689,804	12,442,612	23,480,735
		Exvessel revenue ($)	23,710,261	19,291,484	20,759,342	36,399,904
	WA	Landed weight (lbs)	11,700,416	12,049,827	16,101,625	28,191,992
		Exvessel revenue ($)	25,609,842	24,003,463	26,707,196	45,129,820
Other Management Areas	CA	Landed weight (lbs)				C
		Exvessel revenue ($)				C
	WA	Landed weight (lbs)	6,732,220	7,522,403	6,944,948	6,941,032
		Exvessel revenue ($)	14,084,886	14,752,254	13,548,402	13,259,518
Total Landed weight (lbs)			36,096,394	32,808,140	42,786,861	80,810,513*
Total Exvessel revenue ($)			77,156,690	67,056,957	130,059,907	130,071,468*

Source: PacFIN ftl table. August 2004
Note: C represents data restricted due to confidentiality
"Other management areas" includes inside waters such as Puget Sound and Columbia River
* totals do not include confidential data

Table 3.3.3.12. Top 15 Ports for Dungeness Crab Landings and Revenue (2000 - 2003)

Rank	Top Ports for Dungeness Crab by Weight	Top Ports for Dungeness Crab by Value
1	WESTPORT	WESTPORT
2	ASTORIA	ASTORIA
3	CRESCENT CITY	CRESCENT CITY
4	NEWPORT	NEWPORT
5	BELLINGHAM BAY	BELLINGHAM BAY
6	CHARLESTON (COOS BAY)	CHARLESTON (COOS BAY)
7	EUREKA	EUREKA
8	BROOKINGS	BLAINE
9	BLAINE	BROOKINGS
10	ILWACO	SAN FRANCISCO
11	SAN FRANCISCO	LACONNER
12	CHINOOK	ILWACO
13	LACONNER	CHINOOK
14	TAHOLAH	TAHOLAH
15	ANACORTES	PRINCETON / HALF MOON BAY

Source: PacFIN FTL table. July 2004

Highly Migratory Species Fisheries The HMS fishery management unit includes five tuna species, five shark species, striped marlin, swordfish, and dorado. Complex management of HMS fisheries results from the multiple management jurisdictions, users, and gear types targeting these species, and from the oceanic regimes that play a major role in determining species availability and which species will be harvested off the U.S. West Coast in a given year.

Albacore tuna account for a large majority of the landed weight and value (Table 3.3.3.13). NMFS monitors the numerous species caught by the HMS fishery, but which are not part of the fishery management unit. Commercial fishers use five distinctive gear types to harvest HMS: hook-and-line, driftnet, pelagic longline, purse seine, and harpoon (Table 3.3.3.14). By gear, approximately 27 purse seine, 887 surface hook-and-Line, 121 drift gillnet, 20 longline, and 32 harpoon permits have been issued for the HMS fisheries. While hook-and-line gear catches many HMS species, traditionally it has been used to harvest tunas. The principal target species for hook-and-line fisheries include albacore and other tunas, swordfish and other billfish, several shark species, and dorado. Albacore make up the highest hook and line landings, with the majority taken by troll and jig-and-bait gear (92% in 1999). Gillnet, drift longline, and other gear take a small portion of fish. These gear types vary in the incidence of groundfish interception depending on the area fished and time of year. Overall, nearly half of the total coastwide landings of albacore, by weight, were landed in California.

Fishers use pelagic longline to target swordfish, shark and tunas; drift gillnet gear to target swordfish, tunas, and sharks off California and Oregon; purse seine gear to target tuna off California and Oregon; and harpoon to target swordfish off California and Oregon. Some vessels, especially longliners and purse seiners, fish outside of the EEZ, but may deliver to West Coast ports. Drift gillnets intercept most groundfish, including whiting, spiny dogfish, and yellowtail rockfish. Most landings occur in Washington and Oregon (Table 3.3.3.14), and the top several ports occur in these states (Table 3.3.3.15).

Table 3.3.3.13 Landings and Revenue of HMS by Species and Year

		Year			
Species Type	Data Type	2000	2001	2002	2003
Albacore	Landed weight (lbs)	19,848,814	24,495,425	22,063,692	36,485,624
	Exvessel revenue ($)	17,103,010	20,577,991	14,272,304	24,305,367
Shark	Landed weight (lbs)	547,195	567,274	517,745	491,807
	Exvessel revenue ($)	720,450	670,249	629,727	588,697
Other Tuna	Landed weight (lbs)	1,559,831	1,644,104	78,491	113,077
	Exvessel revenue ($)	900,461	833,464	90,157	100,998
Dorado and Marlin	Landed weight (lbs)	8,946	18,394	C	C
	Exvessel revenue ($)	12,633	13,501	C	C
Swordfish	Landed weight (lbs)	1,252,875	640,799	609,248	980,229
	Exvessel revenue ($)	4,054,296	2,158,192	2,264,288	3,131,158
Total Landed Weight (lbs)		23,217,661	27,365,996	23,269,176*	38,070,737*
Total Exvessel Revenue ($):		22,790,849	24,253,397	17,256,476*	28,126,220*

Source: PacFIN FTL table. July 2004
Note: C represents data restricted due to confidentiality
* totals do not include confidential data

Table 3.3.3.14 HMS Landings and Exvessel Revenue by State, Year, and Major Gear Group

			YEAR			
State	Gear Group	Data Type	2000	2001	2002	2003
CA	Hook and Line	Landed weight (lbs)	2,323,968	2,402,114	4,534,829	2,697,411
		Exvessel revenue ($)	2,741,226	2,334,606	2,945,594	2,741,955
	Net	Landed weight (lbs)	2,902,991	2,802,769	1,090,415	930,255
		Exvessel revenue ($)	3,975,012	2,850,343	2,225,363	1,741,480
	Troll	Landed weight (lbs)	1,964,550	3,907,886	1,364,167	1,360,872
		Exvessel revenue ($)	1,872,012	3,063,523	1,024,421	988,564
OR		Landed weight (lbs)	C	76,513	323,497	C
	Hook and Line	Exvessel revenue ($)	C	41,340	198,261	C
	Net	Landed weight (lbs)	C		C	86,604
		Exvessel revenue ($)	C		C	13,720
	Troll	Landed weight (lbs)	8,755,933	8,948,222	4,036,735	9,039,680
		Exvessel revenue ($)	7,488,326	7,545,405	2,752,640	6,115,181
WA		Landed weight (lbs)	C	C	C	
	Hook and Line	Exvessel revenue ($)	C	C	C	
	Net	Landed weight (lbs)	C			
		Exvessel revenue ($)	C			
	Troll	Landed weight (lbs)	7,020,617	9,145,451	11,776,387	23,792,124
		Exvessel revenue ($)	5,836,813	7,947,279	7,418,555	15,706,940

Source: PacFIN FTL table. July 2004.
Note: C represents data restricted due to confidentiality

Table 3.3.3.15. Top Ports for HMS Landings and Exvessel Revenue (2000 - 2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	ILWACO	ILWACO
2	NEWPORT	NEWPORT
3	WESTPORT	WESTPORT
4	ASTORIA	ASTORIA
5	CHARLESTON (COOS BAY)	SAN DIEGO
6	TERMINAL ISLAND	MORRO BAY
7	EUREKA	SAN PEDRO
8	MORRO BAY	CHARLESTON (COOS BAY)
9	MOSS LANDING	TERMINAL ISLAND
10	BELLINGHAM BAY	EUREKA
11	SAN PEDRO	MOSS LANDING
12	SAN DIEGO	BELLINGHAM BAY
13	OCEANSIDE	SAN FRANCISCO
14	FIELDS LANDING	OCEANSIDE
15	CRESCENT CITY	CRESCENT CITY

Source: PacFIN FTL table. July 2004

Pacific Pink Shrimp Fishery

The Council has no direct management authority over pink shrimp. In 1981, the three coastal states established uniform coastwide regulations for the pink shrimp fishery. The season runs from April 1 through October 31. Regulations authorize pink shrimp commercial harvest only by trawl nets or pots. Trawl gear harvests most of these shrimp off the West Coast from Northern Washington to Central California at depths from 60 fm and 100 fm (110 m to 180 m), with the majority taken off Oregon (Table 3.3.3.16). The ports with highest landings also occur in Oregon, followed by Washington and Oregon ports (Table 3.3.3.17).

Shrimp trawl nets are usually constructed with net mesh sizes smaller than the net mesh sizes for legal groundfish trawl gear. Most shrimp trawl gear has a mesh size of one inch to three-eights inches between knots. Thus, shrimp trawlers commonly catch groundfish, while groundfish trawlers catch little shrimp. In some years the pink shrimp trawl fishery has accounted for a significant share of canary rockfish incidental catch. The Council has discussed methods to control shrimp fishing activities, such as requiring all vessels to use bycatch reduction devices (finfish excluders). Some shrimp and spot trawls (pink shrimp trawls, spot prawns in California and Washington) are required to use a bycatch reduction device (BRD). Finfish excluders have been required in pink shrimp trawls in California since September 2001 and since July 1, 2002 in Oregon and Washington.

Many vessels that participate in the shrimp trawl fishery also have groundfish LE permits. Vessels participating in the pink shrimp fishery must abide by the same rules as vessels that do not have groundfish LE permits. However, all groundfish landed by vessels with LE permits are included in the LE total.

Table 3.3.3.16 Pink Shrimp Landings and Exvessel Revenue by Year and State (LBS and USD)

		YEAR			
State	Data Type	2000	2001	2002	2003
CA	Landed weight (lbs)	2,459,095	3,612,205	4,116,213	2,147,685
	Exvessel revenue ($)	1,049,119	992,644	1,275,023	657,159
OR	Landed weight (lbs)	25,462,479	28,482,140	41,583,534	20,545,976
	Exvessel revenue ($)	10,192,294	7,560,473	11,352,588	5,051,246
WA	Landed weight (lbs)	4,360,914	6,590,344	10,105,043	7,893,802
	Exvessel revenue ($)	1,700,410	1,713,687	2,745,707	1,959,662
Total Landed Weight (lbs)		32,282,488	38,684,689	55,804,790	30,587,463
Total Exvessel Revenue ($)		12,941,823	10,266,804	15,373,317	7,668,068

Source: PacFIN FTL table. July 2004

Table 3.3.3.17 Top 15 Ports for Pink Shrimp Landings and Exvessel Revenue (2000–2003)

Rank	Top Ports by Weight	Top Ports by Exvessel Revenue
1	ASTORIA	ASTORIA
2	NEWPORT	NEWPORT
3	CHARLESTON (COOS BAY)	CHARLESTON (COOS BAY)
4	WESTPORT	WESTPORT
5	GARIBALDI (TILLAMOOK)	GARIBALDI (TILLAMOOK)
6	EUREKA	EUREKA
7	CRESCENT CITY	CRESCENT CITY
8	BROOKINGS	BROOKINGS
9	ILWACO	ILWACO
10	SOUTH BEND	SOUTH BEND
11	TOKELAND	MORRO BAY
12	MORRO BAY	TOKELAND
13	AVILA	AVILA
14	FIELDS LANDING	FIELDS LANDING
15	MONTEREY	MONTEREY

Source: PacFIN FTL table. July 2004

Ridgeback Prawn Fisheries

The Ridgeback prawn fishery occurs exclusively in California, centered in the Santa Barbara Channel and off Santa Monica Bay. In 1999, 32 boats participated in the ridgeback prawn fishery. Traditionally, a number of boats fish year-round for both ridgeback and spot prawns, targeting ridgeback prawns during the closed season for spot prawns and vice versa. Most boats typically use single-rig trawl gear. Shrimp gear accounts for nearly all prawn landings, although groundfish trawl and other gears take minor amounts (Table 3.3.3.18). The top ports for landed weight and exvessel value occur in the Santa Barbara Channel-Santa Monica Bay region (Table 3.3.3.19). The State of California manages the ridgeback prawn fishery. Similar to spot prawn and pink shrimp fisheries, prawns are an “non-groundfish” fishery in the federal OA groundfish fishery, entitling to groundfish trip limits.

Following a 1981 decline in landings, the California Fish and Game Commission adopted a June through September closure to protect spawning female and juvenile ridgeback prawns. Regulations allow an incidental take of 50 pounds of prawns or 15% by weight during the closed period. During the open prawn season, federal regulations limit finfish landings per trip to a maximum of 1,000 pounds, with no more than 300 pounds of groundfish. A vessel operator may land any amount of sea cucumbers with ridgeback prawns as long as the operator possesses a sea cucumber permit. Other regulations include a prohibition on trawling within state waters, a minimum fishing depth of 25 fm, a minimum mesh size of 1.5 inches for single-walled cod ends or 3 inches for double-walled cod ends and maintaining a logbook (required since 1986).

Table 3.3.3.18. Ridgeback Prawn Landings and Exvessel Revenue by Year (LBS and USD)

		YEAR			
Gear Group	Data Type	2000	2001	2002	2003
Trawl	Landed weight (lbs)	141,160	16,920	19,735	12,454
	Exvessel revenue ($)	165,345	26,976	31,599	14,641
Shrimp Trawl	Landed weight (lbs)	1,414,844	340,024	422,240	486,890
	Exvessel revenue ($)	1,633,636	508,853	606,064	669,274
Other Gears	Landed weight (lbs)	10,172			237
	Exvessel revenue ($)	13,201			641
Total Landed Weight (lbs)		1,566,176	356,944	441,975	499,581
Total Exvessel Revenue ($)		1,812,182	535,829	637,663	684,557

Source: PacFIN FTL table. July 2004

Table 3.3.3.19. Rank of All Ports with Ridgeback Prawn Landings and Exvessel Revenue (2000–2003)

Rank	Rank of Ports by Weight	Rank of Ports by Exvessel Revenue
1	SANTA BARBARA	SANTA BARBARA
2	VENTURA	VENTURA
3	OXNARD	OXNARD
4	TERMINAL ISLAND	TERMINAL ISLAND
5	LONG BEACH	LONG BEACH
6	PLAYA DEL REY	PLAYA DEL REY
7	PORT HUENEME	PORT HUENEME
8	SAN PEDRO	SAN PEDRO
9	MORRO BAY	MORRO BAY
10	AVILA	AVILA
11	SAN SIMEON	SAN SIMEON
12	POINT ARENA	POINT ARENA
13	PRINCETON / HALF MOON BAY	PRINCETON / HALF MOON BAY

Source: PacFIN ftl table. August 2004

Salmon

The ocean commercial salmon fishery, non-treaty and treaty, is managed by both the states and the federal government. The Council manages fisheries in the EEZ while the states manage fisheries in their waters. All ocean commercial salmon fisheries off the West Coast states use troll gear, and primarily target chinook and coho. Limited pink salmon landings occur in odd-years. A gillnet/tangle net fishery that does not technically occur in Council-managed waters may have some impact on groundfish that migrate through state waters. Commercial coho landings fell precipitously in the early 1990s and remain very low. In response to the listing of many wild salmon stocks under the ESA, the management regime is largely structured around so-called “no jeopardy standards” developed through the ESA-mandated consultation process. Ocean fisheries are managed according to zones reflecting the distribution of salmon stocks and are structured to allow and encourage capture of hatchery-produced stocks while avoiding depressed natural stocks. The Columbia River, on the Oregon/Washington border; the Klamath River in Southern Oregon; and the Sacramento River in Central California support the largest runs of returning salmon.

California accounts for most landings and revenues of salmon caught in the coastal management areas, followed by Oregon and Washington (Table 3.3.3.20). However, Washington landings in Puget Sound and other non-coastal areas substantially exceed the total coastal landings. Most of the top 10 ports for quantity of landings occur in Washington (Table 3.3.3.21), but the top ports in terms of revenues occur more evenly distributed by state.

The salmon troll fishery has a small incidental catch of Pacific halibut and groundfish, including yellowtail rockfish. The historical data show that salmon troll trips that did not land halibut had a higher range of groundfish landings (11-149 mt) than troll trips that landed halibut (1-19 mt). However, looking at groundfish catch frequency, either by vessel or trips, reveals that groundfish are caught more often by vessels or on trips catching halibut. To account for yellowtail rockfish landed incidentally while not promoting targeting on the species, federal managers have allowed salmon trollers to land up to one pound of yellowtail per two pounds of salmon in 2001, not to exceed 300 pounds per month (north of Cape Mendocino).

Table 3.3.3.20 Salmon Landings and Exvessel Revenue by Area, State, and Year (LBS and USD)

			YEAR			
Area	State	Data type	2000	2001	2002	2003
Coastal Management Areas	CA	Landed weight (lbs)	5,143,030	2,407,615	4,941,537	6,382,942
		Exvessel revenue ($)	10,325,395	4,772,551	7,643,076	12,166,622
	OR	Landed weight (lbs)	1,563,697	2,960,716	3,501,154	3,667,155
		Exvessel revenue ($)	3,069,828	4,736,557	5,388,352	7,198,494
	WA	Landed weight (lbs)	416,030	1,090,350	1,348,292	1,443,320
		Exvessel revenue ($)	566,873	1,096,778	1,313,661	1,594,448
Other Management Areas	OR	Landed weight (lbs)	1,340,819	1,855,600	2,089,757	2,438,378
		Exvessel revenue ($)	961,419	1,125,372	1,543,793	1,586,972
	WA	Landed weight (lbs)	12,750,614	28,791,819	32,904,386	31,122,453
		Exvessel revenue ($)	9,772,895	11,298,116	12,013,803	11,100,583
Total Landed weight (lbs)			21,214,190	37,106,100	44,785,126	45,054,248
Total Exvessel revenue ($)			24,696,410	23,029,373	27,902,685	33,647,119

Source: PacFIN ftl table. August 2004
Note: "Other management areas" includes inside waters such as Puget Sound and Columbia River

Table 3.3.3.21 Top 15 Ports for Salmon Landings and Exvessel Revenue (2000–2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	BELLINGHAM BAY	NEWPORT
2	SEATTLE	FORT BRAGG
3	SHELTON	BELLINGHAM BAY
4	COLUMBIA RIVER PORTS - OREGON	CHARLESTON (COOS BAY)
5	TAHOLAH	BODEGA BAY
6	LACONNER	SAN FRANCISCO
7	NEWPORT	COLUMBIA RIVER PORTS - OREGON
8	EVERETT	SHELTON
9	FORT BRAGG	PRINCETON / HALF MOON BAY
10	TACOMA	SEATTLE
11	BLAINE	MOSS LANDING
12	COPALIS BEACH	TACOMA
13	PORT ANGELES	TAHOLAH
14	BODEGA BAY	PORT ANGELES
15	CHARLESTON (COOS BAY)	BLAINE

Source: PacFIN ftl tables. August 2004

Pacific Halibut

The bilateral (U.S./Canada) IPHC recommends conservation regulations for Pacific halibut, and the governments of Canada and the U.S. implement the regulations in their own waters. The IPHC requires a license to participate in the commercial Pacific halibut fishery in waters off Washington, Oregon, and California (Area 2A). Area 2A licenses, issued for the directed commercial fishery, have decreased from 428 in 1997 to 215 in 2004.The Pacific and North Pacific Fishery Management Councils have responsibility for allocation in Council waters within the IPHC management regime. The Pacific Halibut Catch Sharing Plan (CSP) for Area 2A specifies allocation agreements of the Council, the states of Washington, Oregon, and California, and the Pacific halibut treaty tribes. The CSP specifies recreational and commercial fisheries for Area 2A. The commercial sector has both a treaty and non-treaty components. Regulations limit the directed non-treaty commercial fishery in Area 2A to south of Point Chehalis, Washington, Oregon, and California. Commercial landings have ranged from about 0.5 to 1.0 million pounds (head on dressed weight) and $1.5 to $2.3 million (Table 3.3.3.22). Washington accounts for the majority of the highest-producing ports for landed weight and revenue (Table 3.3.3.23). In the non-treaty commercial sector, the directed halibut fishery receives an allocation of 85% of the harvest and the salmon troll fishery receives 15% to cover incidental catch. The LE primary sablefish fishery north of Point Chehalis, Washington (46º 53' 18" N latitude) may retain halibut when the Area 2A total allowable halibut catch (TAC) is above 900,000 pounds. In 2003, the TAC was above this level, and the allocation was 70,000 pounds. Final landings for this fishery in 2003 were 65,325 pounds; 56% (47,946

pounds) of the allocation was harvested.

Table 3.3.3.22 Pacific Halibut Commercial Landings and Exvessel Revenue by Year and Gear (LBS and USD)

		YEAR			
Gear Group	Data Type	2000	2001	2002	2003
Hook and Line	Landed weight (lbs)	519,645	745,500	949,274	807,131
	Exvessel revenue ($)	1,358,462	1,578,914	1,941,603	2,226,318
Troll	Landed weight (lbs)	25,574	37,639	42,811	48,416
	Exvessel revenue ($)	62,210	78,409	81,505	107,640
Total Landed weight (lbs)		545,219	783,139	992,085	855,547
Total Exvessel Revenue ($)		1,420,671	1,657,323	2,023,108	2,333,98

Source: PacFIN ftl table. August 2004

Table 3.3.3.23 Top 15 Ports for Pacific Halibut Landings and Exvessel Revenue (2000–2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	NEAH BAY	NEAH BAY
2	NEWPORT	NEWPORT
3	PORT ANGELES	PORT ANGELES
4	TAHOLAH	BELLINGHAM BAY
5	BELLINGHAM BAY	TAHOLAH
6	LAPUSH	LAPUSH
7	ASTORIA	ASTORIA
8	WESTPORT	WESTPORT
9	CHARLESTON (COOS BAY)	CHARLESTON (COOS BAY)
10	EVERETT	BLAINE
11	BLAINE	EVERETT
12	FLORENCE	FLORENCE
13	PORT ORFORD	GARIBALDI (TILLAMOOK)
14	GARIBALDI (TILLAMOOK)	CHINOOK
15	CHINOOK	PORT ORFORD

Source: PacFIN ftl table. August 2004

California Halibut

The commercial California halibut fishery extends from Bodega Bay in northern California to San Diego in Southern California, and across the international border into Mexico. California halibut, a state-managed species, is targeted with hook-and-line, setnets and trawl gear, all of which intercept groundfish. Federal regulations allow fishing with 4.5-inch minimum mesh size trawl in federal waters, but California regulations prohibit trawling within state waters, except in the designated “California halibut trawl grounds,” where a 7.5-inch minimum mesh size must be used during open seasons. Historically, California commercial halibut fishers have preferred setnets because of these restrictions, and predominantly use 8.5-inch mesh and maximum length of 9,000. These nets take most of the landings (Table 3.3.3.24) Setnets are prohibited in certain designated areas, including a Marine Resources Protection Zone (MRPZ), covering state waters (to 3 nm) south of Point Conception and waters around the Channel Islands to 70 fm, but extending seaward no more than one mile. In comparison to trawl and setnet landings, commercial hook-and-line catches are historically insignificant. Over the last decade they have ranged from 11% to 23% of total California halibut landings. Most of those landings were made in the San Francisco Bay area by salmon fishers mooching or trolling slowly over the ocean bottom (Kramer et al. 2001). Overall, the ports with highest California halibut landings occur in central and southern California (Table 3.3.3.25).

Table 3.3.3.24. California Halibut Landings and Exvessel Revenue by Year and Gear (LBS and USD)

		YEAR			
Gear Group	Data type	2000	2001	2002	2003
Hook and Line	Landed weight (lbs)	118,519	124,241	166,307	208,887
	Exvessel revenue ($)	366,478	398,222	523,217	654,537
Misc.	Landed weight (lbs)	C	C	C	C
	Exvessel revenue ($)	C	C	C	C
Net	Landed weight (lbs)	380,105	319,235	255,720	181,439
	Exvessel revenue ($)	1,122,396	981,323	820,973	601,822
Pot	Landed weight (lbs)	463	170	1,501	592
	Exvessel revenue ($)	1,225	531	3,594	2,419
Troll	Landed weight (lbs)	9,163	10,382	8,259	13,735
	Exvessel revenue ($)	21,241	24,687	18,784	29,589
Trawl	Landed weight (lbs)	277,878	377,094	451,186	342,609
	Exvessel revenue ($)	728,537	1,076,334	1,276,334	912,487
Shrimp Trawl	Landed weight (lbs)	63,947	66,634	55,534	77,324
	Exvessel revenue ($)	214,903	226,478	203,011	326,085
Total Landed weight (lbs)		850,075	897,756	938,507	824,586
Total Exvessel revenue ($)		2,454,780	2,707,575	2,845,913	2,526,939

Source: PacFIN ftl table. August 2004:
Note: totals exclude confidential data

Table 3.3.3.25 Top 15 Ports for California Halibut Landings and Exvessel Revenue (2000–2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	SAN FRANCISCO	SAN FRANCISCO
2	PRINCETON / HALF MOON BAY	VENTURA
3	VENTURA	PRINCETON / HALF MOON BAY
4	SANTA BARBARA	SANTA BARBARA
5	SAN PEDRO	TERMINAL ISLAND
6	TERMINAL ISLAND	SAN PEDRO
7	OXNARD	OXNARD
8	MOSS LANDING	PORT HUENEME
9	SANTA CRUZ	OCEANSIDE
10	AVILA	SANTA CRUZ
11	PORT HUENEME	AVILA
12	OCEANSIDE	MOSS LANDING
13	MONTEREY	SAN DIEGO
14	SAN DIEGO	MONTEREY
15	MORRO BAY	MORRO BAY

Source: PacFIN ftl table. August 2004

California Sheephead

Pot fishermen account for well over half of the total catch and revenues of Sheephead (Table 3.3.3.26), followed by hook and line gear. Nets and other gears take minimal amounts of Sheephead. The top 15 ports in California have a similar order of landed weight and revenue (Table 3.3.3.27)

Table 3.3.3.26 Landings and Exvessel Revenue of California Sheephead by State, Gear, and Year (LBS and USD)

			YEAR			
State	Gear	Data type	2000	2001	2002	2003
California	Hook and Line	Landed weight (lbs)	33,211	23,928	22,698	24,587
		Exvessel revenue ($)	93,186	73,996	66,304	82,449
	Other Gears	Landed weight (lbs)	1,506	1,268	1,199	2,677
		Exvessel revenue ($)	4,663	2,860	4,100	10,131
	Net	Landed weight (lbs)	3,067	3,097	1,432	474
		Exvessel revenue ($)	5,897	3,401	1,388	1,317
	Pot	Landed weight (lbs)	136,161	121,941	95,719	79,618
		Exvessel revenue ($)	490,773	437,409	339,741	292,673
Total Landed weight (lbs)			173,945	150,234	121,048	107,356
Total Exvessel revenue ($)			594,519	517,666	411,532	386,570

Source: PacFIN ftl table. August 2004

Table. 3.3.3.27 Ports for Sheephead Landings and Exvessel Revenue (2000–2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	OXNARD	OXNARD
2	SAN DIEGO	SAN DIEGO
3	SANTA BARBARA	TERMINAL ISLAND
4	TERMINAL ISLAND	SANTA BARBARA
5	NEWPORT BEACH	NEWPORT BEACH
6	VENTURA	MISSION BAY
7	MISSION BAY	VENTURA
8	OCEANSIDE	OCEANSIDE
9	DANA POINT	DANA POINT
10	SAN PEDRO	SAN PEDRO
11	POINT LOMA	POINT LOMA
12	LONG BEACH	LONG BEACH
13	MORRO BAY	PLAYA DEL REY
14	PLAYA DEL REY	REDONDO BEACH
15	REDONDO BEACH	MORRO BAY

Source: PacFIN ftl table. August 2004

Coastal Pelagic Species

The CPS fisheries are concentrated in California (Table 3.3.3.28), but CPS fishing also occurs in Washington and Oregon. Vessels using round haul gear (purse seines and lampara nets) account for 99% of total CPS landings and revenues per year (Table 3.3.3.29). In Washington, the Emerging Commercial Fishery regulations provides for the sardine fishery as a trial commercial fishery. The trial fishery targets sardines, but also lands anchovy, mackerel, and squid. Regulations limit the fishery to vessels using purse seine gear; prohibits fishing inside of three miles, and requires logbooks. Eleven of the 45 permits holders participated in the fishery in 2000, landing 4,791 mt of sardines (Robinson 2000). Three vessels accounted for 88% of the landings. Of these, two fished out of Ilwaco and one out of Westport. Oregon manages the sardine fishery under the Development Fishery Program under annually-issued permits, which have ranged from 15 in 1999 and 2000 to 20 in 2001. Landings, almost all by purse seine vessels, have rapidly increased in Oregon: from 776 mt in 1999 to 12,798 mt in 2001. The Southern California round haul fleet is the most important sector of the CPS fishery in terms of landings, and most of the highest production ports occur in this area (Table 3.3.3.30). This fleet is primarily based in Los Angeles Harbor, along with fewer vessels in the Monterey and Ventura areas. The fishery harvests Pacific bonito, market squid, and tunas as well as CPS. The fleet consists of about 40 active purse

seiners averaging 20 m in length. Approximately one-third of this fleet are steel-hull boats built during the last 20 years, the remainder are wooden-hulled vessels built from 1930 to 1949, during the boom of the Pacific sardine fleet. Because stock sizes of these species can radically change in response to ocean conditions, the CPS FMP takes a flexible management approach. Pacific mackerel and Pacific sardine are actively managed through annual harvest guidelines based on periodic assessments. Northern anchovy, jack mackerel, and market squid are monitored through commercial catch data. If appropriate, one third of the harvest guideline is allocated to Washington, Oregon, and northern California (north of 35E40' N latitude) and two-thirds is allocated to Southern California (south of 35E40' N latitude). An OA CPS fishery is in place north of 39˚N latitude and a LE fishery is in place south of 39˚ N latitude. The Council does not set harvest guidelines for anchovy, jack mackerel, or market squid (PFMC 1998).

Table 3.3.3.28 CPS Landings and Exvessel Revenue by Area, State, and Year (LBS and USD)

			YEAR			
Area	State	Data type	2000	2001	2002	2003
Coastal Management Areas	CA	Landed weight (lbs)	465,666,430	376,633,573	316,754,663	182,994,919
		Exvessel revenue ($)	40,179,911	29,373,729	27,852,840	29,261,203
	OR	Landed weight (lbs)	21,629,154	29,337,380	50,396,664	56,500,887
		Exvessel revenue ($)	1,173,218	1,726,387	2,835,693	3,016,660
	WA	Landed weight (lbs)	10,937,156	25,573,818	35,995,417	26,872,582
		Exvessel revenue ($)	716,632	1,394,002	2,044,254	1,546,569
Other Management Areas	OR	Landed weight (lbs)	C	C	C	C
		Exvessel revenue ($)	C	C	C	C
	WA	Landed weight (lbs)	530,364	813,484	1,196,872	1,070,620
		Exvessel revenue ($)	208,419	297,702	529,434	510,373
Total Landed weight (lbs)			498,763,104	432,358,255	404,343,616	267,439,00
Total Exvessel revenue ($)			42,278,180	32,791,820	33,262,222	34,334,805

Source: PacFIN ftl table. August 2004
Note: C represents data restricted due to confidentiality
Totals do not include confidential data
"Other management areas" includes inside waters such as Puget Sound and Columbia River

Table 3.3.3.29 CPS Landings and Exvessel Revenue by Year and Gear(LBS and USD)

		YEAR			
Gear Group	Data type	2000	2001	2002	2003
Hook and Line	Landed weight (lbs)	447,269	132,292	46,697	135,851
	Exvessel revenue ($)	64,810	63,396	30,017	53,557
Misc	Landed weight (lbs)	238,310	53,720	90,661	141,291
	Exvessel revenue ($)	82,093	390,882	621,647	463,864
Net	Landed weight (lbs)	496,714,839	430,478,604	404,186,770	266,878,952
	Exvessel revenue ($)	42,035,766	32,142,853	32,605,922	33,761,365
Pot	Landed weight (lbs)	100,375	1,240	347	57,592
	Exvessel revenue ($)	10,194	398	126	15,534
Troll	Landed weight (lbs)	645,533	307,434	558	43,777
	Exvessel revenue ($)	57,140	11,811	666	15,701
Trawl	Landed weight (lbs)	626,541	1,384,594	21,999	181,009
	Exvessel revenue ($)	28,150	182,129	2,734	24,105
Shrimp Trawl	Landed weight (lbs)	1,086	371	1,255	536
	Exvessel revenue ($)	569	351	1,577	678
Total Landed weight (lbs)		498,773,953	432,358,255	404,348,287	267,439,008
Total Exvessel revenue ($)		42,278,722	32,791,820	33,262,689	34,334,805

Source: PacFIN ftl table. August 2004

Table. 3.3.3.30 Top 15 Ports for CPS Landings and Exvessel Revenue (2000–2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	SAN PEDRO	SAN PEDRO
2	PORT HUENEME	PORT HUENEME
3	TERMINAL ISLAND	MOSS LANDING
4	MOSS LANDING	TERMINAL ISLAND
5	ASTORIA	VENTURA
6	VENTURA	ASTORIA
7	ILWACO	SAN FRANCISCO
8	MONTEREY	MONTEREY
9	SAN FRANCISCO	ILWACO
10	WESTPORT	SAUSALITO
11	SAUSALITO	PRINCETON / HALF MOON BAY
12	PRINCETON / HALF MOON BAY	WESTPORT
13	SANTA BARBARA	TACOMA
14	LONG BEACH	MARSHALL
15	MARSHALL	SANTA BARBARA

Source: PacFIN ftl table. August 2004

Sea Cucumber

California implemented a permit program for sea cucumber in 1992. In 1997 the state established separate, LE permits for the dive and trawl sectors. Permit rules encourage permit transfer to the dive sector which has lead to growth in this sector. The dive sector currently accounts for 80% of landings. There are currently 113 sea cucumber dive permits and 36 sea cucumber trawl permits. Many commercial sea urchin and/or abalone divers also hold sea cucumber permits and began targeting sea cucumbers more heavily beginning in 1997. At up to $20 per pound wholesale for processed sea cucumbers, there is a strong incentive to participate in this fishery. California fishers account for the majority of sea cucumbers by weight and value, followed by Washington fishers (Table 3.3.3.31); Oregon has too few participants for public release of data.

Sea cucumbers are managed by the states. Along the West Coast, sea cucumbers are harvested by diving or trawling (Table 3.3.3.32). Only the trawl fishery for sea cucumbers lands an incidental catch of groundfish. The warty sea cucumber is fished almost exclusively by divers. The California sea cucumber is caught principally by trawling in Southern California, but is targeted by divers in Northern California.

The top ports for landed weight and ex-vessel revenue occur roughly equally in California and Washington (Table 3.3.3.33).

Sea cucumber fisheries have expanded worldwide. On the West Coast, a dive fishery for warty sea cucumbers occurs in Baja California, Mexico, and dive fisheries for California sea cucumbers occur in Washington, Oregon, Alaska, and British Columbia, Canada (Rogers-Bennett and Ono 2001). In Washington, the sea cucumber fishery only occurs inside Puget Sound and the Straight of Juan de Fuca. Most of the harvest is taken by diving, although the tribes can also trawl for sea cucumbers in these waters.

Table 3.3.3.31 Sea Cucumber Landings and Exvessel Revenue by Area, State, and Year (LBS and USD)

			YEAR			
Area	State	Data type	2000	2001	2002	2003
Coastal Management Areas	CA	Landed weight (lbs)	643,310	717,695	946,810	758,569
		Exvessel revenue ($)	606,578	584,970	801,276	687,854
	OR	Landed weight (lbs)	C	C	C	C
		Exvessel revenue ($)	C	C	C	C
Other Management Areas	WA	Landed weight (lbs)	605,755	661,657	549,127	438,707
		Exvessel revenue ($)	836,720	903,570	598,820	560,533
Total Landed weight (lbs)			1,249,065	1,379,352	1,495,937	1,197,276
Total Exvessel revenue ($)			1,443,297	1,488,540	1,400,096	1,248,387

Source: PacFIN ftl table. August 2004
Note: C represents data restricted due to confidentiality
"Other management areas" includes inside waters such as Puget Sound and Columbia River

Table 3.3.3.32 Sea Cucumber Landings and Exvessel Revenue by Year and Gear (LBS and USD)

		YEAR			
Gear aggregation	Data type	2000	2001	2002	2003
Misc. (including dive gear)	Landed weight (lbs)	574,689	465,804	660,598	466,855
	Exvessel revenue ($)	558,029	419,318	610,742	475,262
Other Gears	Landed weight (lbs)	674,667	913,583	835,339	731,109
	Exvessel revenue ($)	885,777	1,069,291	789,354	774,084
Total Landed weight (lbs)		1,249,065	1,379,352	1,495,937	1,197,276
Total Exvessel revenue ($)		1,443,297	1,488,540	1,400,096	1,248,387

Source: PacFIN ftl table. August 2004
Note: C represents data restricted due to confidentiality
"Other management areas" includes inside waters such as Puget Sound and Columbia River
totals are equivalent to previous table to protect confidentiality

Table 3.3.3.33 Top 15 Ports for Sea Cucumber Landings and Exvessel Revenue (2000–2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	OXNARD	OXNARD
2	SANTA BARBARA	BLAINE
3	BLAINE	ANACORTES
4	ANACORTES	SANTA BARBARA
5	TERMINAL ISLAND	TERMINAL ISLAND
6	POULSBO	BELLINGHAM BAY
7	BELLINGHAM BAY	POULSBO
8	SEATTLE	SEATTLE
9	TACOMA	TACOMA
10	VENTURA	LACONNER
11	LACONNER	VENTURA
12	PUGET ISLAND	PUGET ISLAND
13	FRIDAY HARBOR	FRIDAY HARBOR
14	SAN PEDRO	SAN PEDRO
15	MISSION BAY	PORT TOWNSEND

Source: PacFIN ftl table. August 2004

Spot Prawn

Spot prawn which are managed by the states have historically been targeted with both trawl and pot gear (Table 3.3.3.34). For the purposes of managing incidentally-caught groundfish, the trawl fishery has been categorized as non-groundfish trawl in the OA sector of the groundfish fishery. However, the landing of spot prawn taken with trawl gear is currently prohibited in all three states. Washington State prohibited the use of trawl nets for harvesting spot prawns after 2003. On February 18, 2003, the California Fish and Game Commission adopted regulations prohibiting the use of trawl nets to take spot prawn. The regulations went into effect on April 1, 2003. Oregon prohibited the use of trawl nets for harvesting spot prawns after 2003. Before 2003, California had the largest and oldest trawl fishery with about 54 vessels operating from Bodega Bay south to the U.S./Mexico border.

The trap fishery began in 1985 with a live prawn segment. The fleet operates from Monterey Bay, where six boats are based, to Southern California, where a 30 to 40 boat fleet results in higher production. Fishers in both fishing areas set traps at depths of 600 feet to 1,000 feet along submarine canyons or along shelf breaks. Between 1985 and 1991 trapping accounted for 75% of statewide landings; trawling accounted for the remaining 25% (Larson 2001). Landings continued to increase through 1998, when they reached a historic high of 780,000 pounds. Growth in participation and a subsequent drop in landings led to the development of a LE program, which is still in the process of being implemented. Other recent regulations include closures, trap limits, bycatch reduction measures for the trawl fishery, and an observer program. California has the top 15 ports for landed weight and ex-vessel revenue (Table 3.3.3.35). (Most vessels operate out of Monterey, Morro Bay, Santa Barbara, and Ventura, although some Washington-based vessels participate in this fishery during the fall and winter.)

Table 3.3.3.34 Spot Prawn Landings and Exvessel Revenue by Year and Gear in California (LBS and USD)

		Year			
Gear	Data type	2000	2001	2002	2003
Pot	Landed weight (lbs)	180,339	218,813	175,497	159,168
	Exvessel revenue ($)	1,646,474	1,993,004	1,607,681	1,505,684
Trawl (all trawl types)	Landed weight (lbs)	266,682	203,346	218,067	6,841
	Exvessel revenue ($)	2,188,968	1,709,452	1,759,197	61,364
Total Landed weight (lbs)		447,021	422,159	393,564	166,009
Total Exvessel Revenue ($)		3,835,442	3,702,456	3,366,877	1,567,049

Source: PacFIN ftl table. August 2004

Note: Spot prawn landings do not show up specifically in landed catch data for WA and OR

Table 3.3.3.35 Top 15 Ports for Spot Prawn Landings and Exvessel Revenue in California (2000–2003)

Rank	Top 15 Ports by Weight	Top 15 Ports by Exvessel Revenue
1	MORRO BAY	MORRO BAY
2	MONTEREY	MONTEREY
3	OXNARD	OXNARD
4	VENTURA	VENTURA
5	DANA POINT	DANA POINT
6	TERMINAL ISLAND	TERMINAL ISLAND
7	SANTA BARBARA	OCEANSIDE
8	OCEANSIDE	SANTA BARBARA
9	SAN DIEGO	MOSS LANDING
10	RICHMOND	SAN DIEGO
11	MOSS LANDING	RICHMOND
12	SAN FRANCISCO	SAN FRANCISCO
13	FORT BRAGG	FORT BRAGG
14	BODEGA BAY	BODEGA BAY
15	HUNTINGTON BEACH	MISSION BAY

Source: PacFIN ftl table. August 2004

Buyers and Processors

Excluding Pacific whiting delivered to at-sea processors, vessels participating in Pacific groundfish fisheries deliver to shore-based processors within Washington, Oregon, and California. Buyers are located along the entire coast; however, processing capacity has been consolidating in recent years. Several companies have left the West Coast or have chosen to quit the business entirely, have been consoloidated or are inactive. This has led to trucking groundfish from certain ports to another community for processing. Therefore, landings do not necessarily indicate processing activity in those communities. However, examination of the species composition of landed catch by state can lead to inferences of some processor characteristics.

According to PacFIN data, in 2002 Oregon had the largest amount of groundfish landings (56%), followed by Washington (28%), and California (16%). In contrast, Oregon has the largest amount of exvessel revenue (40%), followed by California (32%) and Washington (22%), respectively. Oregon accounts for the majority of Pacific whiting landings, which creates a large difference between the percentage of landed catch and exvessel revenue because Pacific whiting has a relatively low price per pound. The relatively high amount of Pacific whiting being landed in Oregon may create a case where many processors must generate capacity to handle large quantities at a time. Groundfish processors in Washington may receive landings from Alaska fisheries. Depending on the amount of catch Washington processors can draw from Alaska fisheries, some groundfish processors may require the capacity to process large amounts of product. California processors concentrating on West Coast fisheries may focus on relatively smaller throughput of groundfish.

The seafood distribution chain begins with deliveries by the harvesters (exvessel landings) to the shoreside networks of buyers and processors, and includes the linkage between buyers and processors and seafood markets. In addition to shoreside activities, processing of certain species (e.g., Pacific whiting) also occurs offshore on factory ships. Several thousand entities have permits to buy fish on the West Coast (Table 3.3.3.36). Of these, 1,780 purchased fish caught in the ocean area and landed on Washington, Oregon, or California state fishtickets in the year 2000 (excluding tribal catch) and 732 purchased groundfish (PFMC 2004).[1]

According to PacFIN data, the number of unique companies buying groundfish along the West Coast has

[1]/ A "buyer" was defined here by a unique combination of PacFIN port code and state buyer code on the fishticket. For California, a single company may have several buying codes that vary only by the last two digits. In PacFIN, these last two digits are truncated, and so were treated as separate buying units only if they appear for different ports.

declined in recent years. This trend coincides with recent regulatory restrictions and diminished landings of higher valued species such as rockfish. The number of buyers purchasing other species such as crab and salmon has been stable or increasing in recent years.

Table 3.3.3.36 Count of Fish Buyers by Year, Species Type, and State (not unique records)

		Year			
State	Species Group	2000	2001	2002	2003
CA	Coastal Pelagic	174	126	118	112
	All Crab	298	306	291	351
	Groundfish	412	385	324	310
	HMS	233	241	222	199
	Other species	558	515	510	505
	All Salmon	277	225	269	273
	All Shell fish	6	10	2	2
	All Shrimp & Prawns	154	126	129	107
OR	Coastal Pelagic	14	15	16	16
	All Crab	67	77	81	83
	Groundfish	84	74	79	81
	HMS	96	112	125	138
	Other species	90	91	103	94
	All Salmon	104	134	143	150
	All Shell fish	19	14	46	27
	All Shrimp & Prawns	36	36	30	26
WA	Coastal Pelagic	12	17	16	15
	All Crab	125	125	158	168
	Groundfish	43	42	40	45
	HMS	37	39	55	53
	Other species	109	102	98	106
	All Salmon	189	218	219	213
	All Shell fish	167	178	177	171
	All Shrimp & Prawns	75	72	72	80

Source: PacFIN ftl and ft tables. July 2004
Note: records are not unique buyers and should not be summed

Fishing Communities

Fishing communities, as defined in the MSA, include not only the people who catch the fish, but also those who share a common dependency on directly related fisheries-dependent services and industries. Commercial fishing communities may include boatyards, fish handlers, processors, and ice suppliers. Similarly, entities that depend on recreational fishing may include tackle shops, small marinas, lodging facilities catering to out-of-town anglers, and tourism bureaus advertising charter fishing opportunities. People employed in fishery management and enforcement makes up another component of fishing communities. Fishing communities on the West Coast depend on commercial and/or recreational fisheries for many species. Participants in these fisheries employ a variety of fishing gears and combinations of gears. Community patterns of fishery participation vary coastwide and seasonally, based on species availability, the regulatory environment, and oceanographic and weather conditions. Communities are characterized by the mix of fishery operations, fishing areas, habitat types, seasonal patterns, and target species. Although unique, communities share many similarities. For example, all face danger, safety issues, dwindling resources, and a multitude of state and federal regulations. Individuals in unique communities have differing cultural heritages and economic characteristics. Examples include a Vietnamese fishing community of San Francisco Bay and an Italian fishing community in Southern California. Native U.S. communities with an interest in the groundfish fisheries are also considered. In spite of a variety of ethnic backgrounds, fishers in many areas come together to form fishing communities,

drawn together by their common interests in economic and physical survival in an uncertain and changing ocean and regulatory environment. The top 15 ports for OA groundfish and revenue are found in Table 3.3.3.37.

Table 3.3.3.37 Top Ports for Open Access Groundfish Landings and Revenue (2000 - 2003)

Rank	Top 15 Ports for Landed Revenue	Top 15 Ports for Landed Weight
1	Morro Bay	Moss Landing
2	Port Orford	Neah Bay
3	Moss Landing	Fort Bragg
4	Fort Bragg	Port Orford
5	Gold Beach	Port Angeles
6	Avila	Morro Bay
7	Santa Barbara	Gold Beach
8	Port Angeles	Westport
9	Crescent City	Eureka
10	Neah Bay	Crescent City
11	San Francisco	Astoria
12	Monterey	San Francisco
13	Astoria	Avila
14	Eureka	Charleston (Coos Bay)
15	Westport	Brookings

Source: PacFIN VSMRFD files. July 2004

An overview of West Coast fishing communities organized around regions comprising port groups and ports consistent with the organization of fish landings data in the PacFIN database can be found in the The Pacific Coast Groundfish Fishery Management Plan, EFH Designation and Minimization of Adverse Impacts, Draft EIS, prepared in February 2005.

Enforcement

Scarce state and federal resources also limit the use of traditional enforcement methods. Traditional fishery monitoring techniques include air and surface craft surveillance, declaration requirements, landing inspections, and analysis of catch records and logbooks. Current assets for patrolling offshore areas include helicopter and fixed wing aircraft deployed by the U.S. Coast Guard and state enforcement entities, one large 210 foot Coast Guard cutter, and smaller Coast Guard and state enforcement vessels. Only the aircraft and large cutter are suitable for patrolling the more distant offshore closed areas. The availability of Coast Guard assets may be challenged by other missions such as Homeland Security and search and rescue.

Shoreside enforcement activities complement at-sea monitoring and declaration requirements by inspecting recreational and commercial vessels for compliance with landing limits, gear restrictions, and seasonal fishery closures. State agencies are increasingly using dockside sampling as a means of assessing groundfish catch in recreational fisheries, which when combined with state and federal enforcement patrols at boat launches and marinas, provides a means of ensuring compliance with bag limits and fishery closures. Commercial landings are routinely investigated upon landing or delivering to buying stations or processing plants and can be tracked through fish ticket and logbook records.

4.0 IMPACTS OF THE ALTERNATIVES

The terms "effect" and "impact" are used synonymously under NEPA. Impacts includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Direct effects are caused by the action itself and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Cumulative impacts are those impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Sections 4.1 through 4.3 of this document discusses the direct and indirect impacts on the physical, biological, and socio-economic environment that are likely to occur under each of the proposed alternatives, including the status quo alternative. Section 4.4 presents the reasonably foreseeable cumulative effects of the environment from the proposed alternatives.

4.1 Physical Impacts

PHYSICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 1 Status quo	Direct impact No direct impacts beyond what has been considered in previous NEPA documents. Indirect impact Little data available to assess OA fishing location and intensity.
Alternative 2 Vessels using longline gear	Direct impact Data from approximately vessels 322 vessels that use longline gear to take and retain, possess or land OA groundfish (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Longline gear primarily affects benthic environment when it slides on the bottom during setting and retrieval. Indirect impact VMS data from approximately 322 vessels using longline gear can be combined with data on fishing gear impacts and habitat to better understand how effort shifts affect the physical environment.
Alternative 3 Vessels using longline or pot gear	In **addition** to impacts identified for the 322 vessels under Alt. 2 Direct impact Data from approximately 193 vessels that use pot gear to take and retain, possess or land OA groundfish (145 directed groundfish, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from pot gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Pots affect benthic habitat where individual pots contact seabed and when gear is dragged along the bottom during retrieval. Indirect impact VMS position data from approximately 193 vessels using pot gear can be combined with data on fishing gear impacts and habitat to better understand how pot vessel effort shifts affect the physical environment.
Alternative 4A Vessels using longline, pot or trawl gear, except: pink shrimp trawl	In **addition** to impacts identified the 515 vessels under Alt. 2 and 3 Direct impact Data from approximately 77 vessels using nongroundfish trawl gear, excluding pink shrimp trawl, (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Deterring illegal trawling in habitat protection areas is most important because trawl gear is believed to have a greater negative effect on benthic organisms and structure than other OA fishing gears. Includes approximately 59% of the OA nongroundfish trawl vessels that currently do not have VMS requirements. Indirect impact VMS position data from approximately 77 vessels using trawl gear can be combined with data on fishing gear impacts and habitat to better understand how trawl gear effort shifts affect the physical environment. Understanding where 59% of the nongroundfish bottom trawl vessel's effort is distributed is most important because trawl gear is believed to have greater impact on physical habitat than OA fixed gears.

PHYSICAL ENVIRONMENT - Continued	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts identified for the 515 vessels under Alt. 2 and 3 Direct impact Data from approximately 131 vessels using nongroundfish trawl gear, including pink shrimp trawl (54 pink shrimp vessels. 23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels) could be used to maintain the integrity of habitat protection areas. Proposed habitat protection areas are most restrictive to bottom trawl gears. Unforeseen effects from nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Deterring illegal trawling in habitat protection areas is most important because trawl gear is believed to have a greater negative effect on benthic organisms and structure than other gears used in the OA fisheries. All OA nongroundfish trawl vessels that do not currently have VMS requirements would be included. Indirect impact VMS position data from approximately 131 vessels (100% of the OA nongroundfish trawl vessels) using trawl gear can be combined with data on fishing gear impacts and habitat to better understand effort shifts and potential effects on the physical environment. Understanding where nongroundfish bottom trawl effort is distributed is important because trawl gear is believed to have a greater impact on physical habitat than other OA fishing gears.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	In **addition** to impacts identified for the 592 vessels under Alt. 2, 3 and 4A Direct impact Data from approximately 658 vessels using line gear (590 groundfish directed, 58 CA halibut, and 10 HMS vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from line gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Of the OA gears, line gear is believed to have the least contact with the seabed and bottom dwelling organisms, and therefore the lowest risk to benthic habitat if incursions into habitat protection areas occur. Indirect impact VMS position data from approximately 658 vessels using line gear can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment.
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline and line, and Dungeness crab pot gear	Direct impact Data from approximately 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and nongroundfish trawl gear (excluding pink shrimp trawl) on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Without pink shrimp, approximately 59% of the nongroundfish OA trawl fleet would have VMS. Indirect impact VMS position data from 1,453 longline, pot, nongroundfish trawl, and line gear vessels can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment.

PHYSICAL ENVIRONMENT - Continued	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl	Direct impact Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels); and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and nongroundfish trawl gear (excluding pink shrimp trawl) on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Without pink shrimp, approximately 59% of the nongroundfish OA trawl fleet would have VMS. Indirect impact VMS position data from approximately 1,583 longline, pot, nongroundfish trawl, and line gear vessels can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment.
Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl	Direct impact Essentially the same as Alt. 6A except that data that could be used to maintain the integrity of areas closed to protect habitat from fishing gear impacts is not available for 176 salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. Total of 1,525 vessels. Indirect impact Essentially the same as Alt. 6A except that position data from 176 salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. would not be available.
Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl	Direct impact Essentially the same as 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available. Total of 1,561 vessels. Indirect impact Essentially the same as 6A except that data from approximately 22 vessels would not be available. However, it is likely that none of these small vessels fish seaward of 3 miles.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal	Direct impact Data from 1,463 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels using directed groundfish pot gear; 40 vessels using CA halibut trawl gear, and; 882 vessels using line gear (590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and CA halibut nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Approximately 31% of the OA nongroundfish trawl fleet would have VMS. Indirect impact VMS position data from approximately 1,463 vessels can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment. This alt. provides trawl data for only 31% of the OA non groundfish trawl fleet. Understanding where nongroundfish bottom trawl effort is distributed is important because trawl gear is believed to have a greater impact on physical habitat than other OA fishing gears.

PHYSICAL ENVIRONMENT - Continued	
PHYSICAL STRUCTURE	Changes to the physical environment as a result of VMS regulations
Alternative 9 Directed OA vessels - those that land more than 500 lb of groundfish in a calendar year.	Direct impact Data from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 vessels using CA halibut and 3 vessels using pink shrimp trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear (590 groundfish directed, 1 HMS and 6 salmon troll vessels) could be used to maintain the integrity of habitat protection areas. Unforeseen effects from longline, pot, line, and nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. Proposed habitat protection areas are most restrictive to bottom trawl gear. Approximately 7% of the OA nongroundfish trawl fleet would have VMS. Indirect impact Provides VMS position data from approximately 1,123 longline, pot, nongroundfish trawl, and line gear vessels that can be combined with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment. This alternative provides trawl data for only 7% of the OA non groundfish trawl fleet. Understanding where nongroundfish bottom trawl effort is distributed is important because trawl gear is believed to have a greater impact on physical habitat than other OA fishing gears.
Alternative 10 No Action, No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact No direct impacts beyond what has been considered in previous NEPA documents for status quo. Indirect impact Little data available to assess OA fishing location and intensity.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.1.1 Physical structure

The proposed action pertains to a VMS monitoring program that provides vessel position information for monitoring fishing locations in relation to time/area closures. The fleet coverage level, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the proposed alternatives. Each of the alternatives defines the portion of the OA fleet, that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Direct effects on the physical environment result from changes to the structure of the benthic environment as a result of fishing practices. Direct effects on the physical environment from VMS could occur if, as a result of the position information being collected, changes to the physical environment from OA groundfish fishing either increased of decreased. VMS data could be used to maintain the integrity of habitat protection areas designed to protect the physical environment from fishing gear impacts and would therefore provide a positive benefit.

In June 2005, the Council reviewed the Pacific Coast Groundfish, Essential Fish Habitat Designation and Minimization of Adverse Impacts, Draft EIS (EFH EIS). In response to the EFH EIS, the Council recommended that NMFS implement specific habitat protection measures under Amendment 19 to the FMP. Measures to protect benthic habitat included: 1) Prohibit dredge, beam trawl, and bottom trawl gear with footrope diameter greater than 19" throughout the EEZ; 2) prohibit bottom trawl fishing within the EEZ seaward of 700 fathoms; 3) prohibit bottom trawl with footrope greater than 8" shoreward of 100 fathoms; 4) close specified areas to bottom trawl (Scottish seine gear would be exempt); 5) close specified areas to any type of bottom contact gear, and; 6) Close specified areas to all fishing. The Council's recommended action affects groundfish LE bottom trawl vessels that are already required to have VMS, as well as vessels using nongroundfish trawl gear that participate in the OA groundfish fishery and vessels using other OA gears that currently do not have VMS requirements.

The fishing gears used in the OA groundfish fishery each have different direct effects on the seabed or benthic environment. The amount of direct contact with the seabed, bottom structures, and benthic organisms varies widely between the different gears, as does the intensity of the contact. A brief summary of type of contact each OA gear makes with the seabed is presented in this EA. However, chapter 3, The Affected Environment, of the EFH EIS contains a full discussion of the fishing gears used by OA fishers, the effects of each gear on the seabed, and the organisms that are affected. The EFH EIS also describes the physical impacts on the environment under status quo management.

The words "pot" and "trap" are used interchangeably to mean baited boxes set on the ocean floor to catch various fish and shellfish. They can be circular, rectangular or conical in shape. The pots may be set out individually or fished in stings with weights or anchors at each end. The effect of a pot gear on the seabed is related to the weight and structure of the pot as well as to how far and fast the pot moves along the seabed while it is being retrieved. The gear, groundline, and weights or anchors can effect bottom organisms and structure if they are drug along the bottom before ascent (Rose et al.2002).

Longline fishery involves the setting out of a horizontal line to which other lines (gangions) with baited hooks are attached. This horizontal line is secured between anchored lines and identified by floating surface buoys, bamboo poles and flags. The longline may be laid along or just above the ocean floor (a bottom longline) or may be fished in the water column (floating or pelagic longline). The anchors or weights, the hooks and the mainline on longline gear can produce effects on the seabed as they travel over the seabed during setting or retrieval. The key determinant of the effects of longlines on the seabed is how far the gear travels during setting and retreval. Significant travel distance is more likely during retrieval. If the hauling vessel is not directly above the part of the line that is being lifted, the line, hooks and anchors can be pulled across the seabed before ascending. If the hooks and lines snare exposed organisms they can be injured or detached. Lines may undercut emergent structures or roll over them.

The relatively low breaking strength of the line may limit damage of more durable seafloor features (Rose et al. 2002). The mainline can also be moved numerous feet along the bottom and up into the water column by fish, resulting in disturbance to bottom organisms that are in the path of the groundline (Johnson 2002).

Trawling involves the towing of a funnel shaped net or nets behind a fishing vessel. Trawl gear may be fished on the bottom, near the bottom, or up in the water column to catch a large variety of species. The mouth of a trawl net is spread horizontally in the water column by using two doors located one on each side of the net, forward and outward of the net. The doors, generally made of metal, are pushed apart and down by hydrodynamic forces and by their own weight, and some increase their spread by bottom friction. The footrope or ground rope is directly attached to the lower leading edge of the mouth of the net. The head rope is the top of the mouth of the net (also called floatline). The footrope may be weighted with chain or may be rope-wrapped cable when used on a soft bottom. If the net is to be towed over rough bottoms (as for spot prawns) or over soft sea beds that may contain boulders, rubber disks or rubber rollers (also called bobbins) are attached to the footrope under the center and wing sections of the net, to allow the net to ride over obstacles.

Variations in the composition and design of the components of a trawl net changes the influence and effects on benthic ecosystems. Of the major components, trawl doors, affect the smallest area of seabed, though trawl door marks are the most recognizable and the most frequently observed effect of trawls on the seabed. The doors travel across the seabed oriented at an angle to the direction of travel. The resulting track marks consist of the area of direct contact as well as a berm of sediment displaced toward the trawl centerline. The bridles are cables that connect the trawl doors to the trawl net. The bridles may also be in contact with the seabed for a part of the towing distance. Footrope effects are related in part to the contact force and the area over which this force is distributed. The netting may also retain objects and organisms that are undercut or suspended off the seabed by the passage of the footrope.

The pink shrimp trawl fishery commonly uses a four seam net in a box trawl that does not have a hood. It is a high-rise trawl. Unlike other cod-ends, the cod-end of shrimp net is generally not constructed with riblines that run the length of the cod-end. A single rigged shrimp vessel may use the same doors that are used by groundfish trawl vessels, while a double rigged shrimp vessel uses doors that are typically much larger than those used by groundfish trawlers. Shrimpers seek stable doors that can get down to the bottom fast. They are generally made of wood with a wide flat steel shoe (heavy plate) on the bottom. The doors are rigged with short bridles to the net. The footropes used in pink shrimp trawling are not protected with any rollers or bobbins or other gear and are generally rigged to run about 12-18 inches off the bottom (31-46cm). That is, the footrope of shrimp nets is not designed to contact the bottom. Tickler chains or ladder chains, are sometimes used in the shrimp trawl to drag along the muddy bottom to stir up the shrimp so they rise and enter the net. Unless chain is used or supplementary weights are added, the bridles skim the surface of the seabed. Small-scale vertical features on soft substrates can be flattened by this action. Emergent structures and organisms can be vulnerable to penetration or undercutting by bridles.

In the OA fishery, there is a variety of commercial line gears that use hooks and lines in various configurations. These include vertical hook and line, jigs, handline, rod and reel, vertical and horizontal setline, troll, cable gear and stick gear. Vertical hook-and-line gear involves a single line anchored at the bottom and buoyed at the surface so as to fish vertically. Baited circle hooks are spaced about 12 inches apart (30.5 cm) and are tied, with monofilament leader, to the mainline. The vertical hook and line anchor has contact with the seabed. Handline and jig fisheries use vertical, weighted monofilament lines on which baited hooks are attached at intervals using wire spreaders or individual leaders are attached with swivels. The jig (weight) is periodically dropped to the seabed to determine depth. Albacore (an HMS species) jigs are fished on the surface of the water. Fishing poles rigged with monofilament line of various strengths and hooks of various sizes and designs are used. When fishing near the bottom or near reefs, the sinkers may come in contact with the substrate. Stick gear uses a plastic (PVC) or aluminum pipe which is suspended from a mainline and weighted with about a three pound weight (1.5 kg). Wire spreaders are

attached at a selected distance up and down the pipe. Leaders are attached with a swivel clip to these wire spreaders. The weight contacts the seabed and can bounce along the bottom.

Troll gear is used to harvest salmon and groundfish. Trolling involves towing multiple lines with multiple hooks behind a vessel moving at speeds suited to the fish desired. Salmon troll uses steel lines (main lines), attached to the poles by a tag line, which are weighted with 20-65 pound (9-29 kg) lead weights called cannonballs. Up to four main lines are used on each outrigger, though two or three mainlines are most common. Each line may have four to ten spreads per line depending on the species of salmon targeted. Salmon are fished pelagically as well as close to the bottom. Most salmon troll gear never comes in contact with the seabed. In order to avoid loss of line and outriggers if hang-ups occur, the cannonball weights may be attached to the lines by leather straps or other lighter line which is designed to break should the weight hang up on the seabed or gear. One type of troll gear used for groundfish is often called 'dingle bar'gear, so named because when the five to seven foot iron bar (1.5-1.75" in diameter) touches bottom there is a distinct 'ding' transmitted up the steel trolling wire. The gear is designed to be fished three to six feet above rocky bottom and the iron weight is allowed to touch the bottom only occasionally. This gear is used primarily to target lingcod and is very selective. The iron and steel "dingle" bars can contact the seafloor. The hooks and line can snag on break hard corals, while leaving soft corals unaffected. During retrieval, invertebrates and other lightweight organisms can also be dislodged as well as rocks, corals, kelps and other objects.

Gillnets are flat, rectangular nets that hang vertically in the water from a buoyed cork line that is weighted with a lead line. The nets are made of a lightweight multifilament nylon or monofilament strands with mesh sized to select the specific catch. Gillnets can either be fished as a set or anchor net (setnet). The cork and lead lines and the nylon nets are much lighter than those used in seine netting, while the anchors used on set gillnets are often heavier or larger than those used with longlines (Rose et al. 2002). The benthic effects of a set gillnet fishing operation occurs during the retrieval of the gear. During retrieval the nets and leadlines are more likely to snag bottom structures or the exposed sedentary benthos. The anchoring system can also affect bottom organisms and structure if they are dragged along the bottom before ascent. A trammel net is a gillnet made with two or more walls joined to a common float line.

One of the major benefits of VMS is its deterrent effect. VMS is expected to have a beneficial deterrent effect (the reduction in illegal fishing in closed areas when fishing vessel operators know that they are being monitored) by reducing the likelihood of unforeseen effects on the physical environment resulting from unknown illegal fishing in area that are closed to protect habitat from fishing gear effects. It has been demonstrated that if fishing vessel operators know that they are being monitored and that a credible enforcement action will result from illegal activity, then the likelihood of that illegal activity occurring is significantly diminished. In this context, VMS is a preventive measure that may reduce potential violations.

Indirect impacts from fishery management actions include changes in fishing practices that affect the physical environment, but are further away in time or location than those occurring as a direct impact. Area management involves closing and sometimes opening areas formerly closed to specific OA fishing gear groups. When the size or location of closed areas change, the fishing fleet makes shifts in fishing effort. Understanding the nature of effort shifts, especially understanding where the effort shifts to (and the habitat types most common in these areas) and where the effort shifts from (and the habitat types most common in these areas), is critical to understanding how management actions will likely increase or decrease beneficial and adverse impacts to habitat.

VMS is expected to provide data that can be used in combination with data on fishing gear impacts and habitat to better understand effort shifts and the potential effects on the physical environment. Therefore, VMS provides an indirect benefit to the physical environment. The amount of information available for assessing the impacts of fishing effort on the physical environment varies under each of the alternatives. The indirect effects vary between the alternatives and depends on the proportion of the fleet that is required to carry VMS and provide declaration reports, as well as the potential impacts associated with a particular gear type.

Comparison of the Alternatives

Alternative 1, Status Quo, would continue the requirement for declaration reports from OA vessels using nongroundfish trawl gear in the RCAs. Under Alternative 1, OA fishery position data would only be available from vessels who voluntarily use VMS units and from vessels that fish pursuant to the OA regulations, but carry VMS because the vessel is registered to a LE permit. Section 3.3 of the EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery, addressed the physical impacts on the environment under status quo management. In addition, EFH EIS describes the physical impacts on the environment under status quo management.

Alternative 2 maintains the declaration provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 would require the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provide the least amount of data for monitoring vessel compliance with habitat protection areas or for assessing fishing effort and intensity relative habitat areas of concern. Longline gear primarily affects the benthic environment when it is slides on the bottom during setting and retrieval. Given the mobility of vessels within the fishery, directed longline vessels could choose to change gears to avoid the VMS requirements.

Approximately 515 vessels would be required to have VMS under Alternative 3. Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) using pot gear to take and retain, possess or land groundfish. The addition of the pot gears to the VMS program under Alternative 3 will aid in maintaining the integrity of closed areas that are designed to protect the benthic environment from the longline and pot gear impacts. Pots affect benthic habitat where individual pots contact seabed and when gear is dragged along the bottom during retrieval. Similar to Alternative 2, under Alternative 3, some vessels may choose to fish with line gear to avoid the VMS requirements. Alternative 3 would provide more data than Alternative 2, however it would provide less data than Alternative 4A which would require VMS to be carried by 592 vessels.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the pot and longline vessels identified under Alternative 3. The primary difference between Alternatives 4A and 4B is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear. While Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. Approximately 646 vessels would be required to have and use VMS under Alternative 4B.

When reviewing the EFH EIS the Council made recommendations to NMFS that recognized the need to adopt measures to protect benthic habitat from fishing gear impacts, particularly from bottom trawl gear impacts that occur from both groundfish and nongroundfish bottom trawl gear. The need to monitor all bottom trawl vessels for compliance with VMS was also recognized by the Council. Alternative 4A and 4B would aid in maintaining the integrity of habitat protection areas in relation to longline, pot and trawl gear incursions. Deterring illegal trawling in habitat protection areas is most important because trawl gear is believed to have a greater negative effect on benthic organisms and structure than other OA fishing gears. Alternative 4A Includes approximately 59% of the OA nongroundfish trawl vessels that currently do not have VMS requirements while Alternative 4B includes all of the nongroundfish trawl vessels. The benefits of maintaining the integrity of the habitat protections areas where bottom trawling is prohibited is greatest under Alternative 4B.

Alternative 5A includes vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon

troll. Therefore, Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 groundfish, 58 California halibut, and 10 HMS vessels using line gear. The total number of vessels required to have and use VMS under Alternative 5A is 1,250. Alternative 5B is based on the Enforcement Consultant's recommendations to the Council. This alternative is the same as 5A except that it excludes vessels in fisheries where incidental catch of overfished species was considered to be very low, but it does include salmon troll vessels. Alternative 5B includes approximately 1,453 vessels. Of the OA fishing gears, the line gears are projected to have the least contact with the benthic habitat and will therefore have fewer habitat area closures than bottom or pink shrimp trawl. Because Alternative 5A and 5B exclude the pink shrimp trawl vessels, the ability to maintain the integrity of habitat areas closed to bottom trawling is reduced over Alternative 4B.

Alternative 6A, applies to any vessel engaged in commercial fishing to which an RCA restriction applies. Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of habitat protection areas. Alternative 6A affects the largest number of OA vessels and would therefore provide the largest amount of position data for monitoring incursions into habitat protection areas or for assessing fishing effort and intensity relative to habitat areas of concern. Because Alternative 6A excludes the pink shrimp trawl vessels, it only includes about 59% of the OA nongroundfish trawl vessels. Therefore, the ability to maintain the integrity of habitat areas closed to bottom trawling is reduced over Alternative 4B. The impacts on the physical environment resulting from Alternative 6B are essentially the same as Alternative 6A except that data that could be used to maintain the integrity of areas closed to protect habitat from fishing gear impacts would not be available for salmon troll vessels that retain only yellowtail rockfish north of 40°10' N. lat. Alternative 6B includes 176 salmon troll vessels as compared to 234 under Alternative 6A. Because salmon troll gear is believed to have minimal contact with the seabed, Alternative 6B provides only a slightly greater ability to maintain the integrity of habitat protection areas from salmon troll impacts. Impacts on the physical environment resulting from Alternative 7 are essentially the same as 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available. It is likely that none of these small vessels are fishing outside of 3 miles.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Approximately 1,463 vessels are included under Alternative 8: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Data from the sea cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8. Proposed habitat protection areas are most restrictive to bottom trawl gear. Therefore, the ability to maintain the integrity of habitat protection areas from trawl fishing gear impacts associated with these vessels and to gather data that may be used to better understand effort shifts and the potential effects on the physical environment is reduced over Alternatives 4A-7. Under Alternative 8, approximately 31% of the OA nongroundfish trawl fleet would have VMS.

Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8. Under Alternative 9, data from 1,123 vessels could be used to maintain the integrity of habitat protection areas from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab, 2 prawn and 2 sheephead); 9 California halibut 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll

vessels). Unforeseen effects from longline, pot, line, and nongroundfish trawl gear on the physical environment resulting from illegal fishing in the habitat protection areas will likely be reduced as a result of the deterrent effect. However, only about 7% of the OA nongroundfish trawl fleet would have VMS under Alternative 9. Proposed habitat protection areas are most restrictive to bottom trawl gear. Therefore, the ability to maintain the integrity of habitat protection areas from trawl fishing gear impacts associated with these vessels and to gather data that may be used to better understand effort shifts and the potential effects on the physical environment is reduced over Alternatives 4A-7.

The projected impacts on habitat resulting from Alternative 10, are essentially the same as those identified under Alternative 1 except that secondary benefits to the physical habitat resulting from the existence of nontrawl and nongroundfish trawl RCAs for the OA fisheries may no longer exist. Although RCAs were not developed for habitat protection, but rather to reduce fishing effort in areas where overfished species were most abundant, there may have a secondary benefit, particularly in respect to the non-groundfish trawl RCAs.

4.2 Biological Impacts

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 1 Status quo	Direct impacts A higher level of fishing mortality than those being used to estimate total catch, may affect the integrity of closed areas if incursions result in higher rates of overfished species catch than is projected. Indirect impacts Little specific information on OA fishing location data is available for understanding impacts of effort shifts on adult and juvenile groundfish populations, or for refining overfished species total catch estimates. Declaration reports may be used to estimate the number of vessels/trips in conservation areas by nongroundfish trawl vessels.
Alternative 2 Vessels using longline gear	Direct impacts Data from approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) using longline gear to take and retain, possess or land OA groundfish can be used to maintain the integrity of RCAs. The risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs is reduced for directed groundfish and Pacific halibut longline vessels that take and retain, possess or land groundfish. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. No change over Alt.1 for HMS longline vessels because pelagic longline is currently prohibited gear in the EEZ. Indirect impacts Fishing effort and location data from 322 longline vessels could improve the understanding of groundfish mortality. Data can be combined with observer, survey, and fish ticket data to better estimate: 1) total fishing mortality, 2) impacts on juveniles and other fishery resources related to changes in fishing locations and intensity, 3) fishing intensity (amount of time vessels are in an area), and 4) changes in fishing location and intensity over time.
Alternative 3 Vessels using longline or pot gear	In **addition** to the impacts from the 322 vessels identified under Alt. 2: Direct impacts Data from approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) using pot gear to take and retain, possess or land OA groundfish can be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species is reduced for directed groundfish pot and prawn vessels. However, the risks of exceeding the OYs due to incursions by Dungeness crab, CA sheephead, and prawn pot vessels is relatively low Indirect impacts Fishing effort and location data from approximately 193 vessels could improve the understanding of groundfish mortality for pot vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 4A Vessels using longline, pot or trawl gear, except: pink shrimp trawl	In **addition** to impacts from the 515 vessels identified under Alt. 2 & Alt. 3: Direct impacts Data from approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear can be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species is reduced for nongroundfish trawl vessels. Maintaining the integrity of the RCAs will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs. Indirect impacts Fishing effort and location data from approximately 77 vessels could improve the understanding of groundfish mortality for trawl vessels in the same ways as identified under Alt. 2 for longline vessels.

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts from the 515 vessels identified under Alt. 2 & Alt. 3: Direct impacts Data from approximately 131 vessels (54 pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear can be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species is reduced for nongroundfish trawl vessels. Maintaining the integrity of the RCAs will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs. No change over Alt.4A, because pink shrimp vessels are not prohibited from fishing in the RCAs. Indirect impacts Fishing effort and location data from approximately 131 vessels could improve the understanding of groundfish mortality for trawl vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	In **addition** to impacts from the 592 vessels identified under Alt. 2, 3, and 4A: Direct impacts Data from approximately 658 vessels (590 groundfish directed, 58 CA halibut, and 10 HMS) using line gear that take and retain, possess or land OA groundfish can be used to maintain the integrity of RCAs. The risk of actual catch exceeding overfished species OYs is reduced for directed groundfish vessels. Maintaining the integrity of the RCAs will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs. No change over Alt. 1 for HMS line vessels because they are not projected to catch overfished species. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as the result of salmon troll vessels altering their gear to catch groundfish in the RCAs are greater than Alt. 5B. Indirect impacts Fishing effort and location data from approximately 658 line gear vessels that could improve the understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline and line, and Dungeness crab pot gear	Direct impacts Data from 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) can be used to maintain the integrity of RCAs. No change over Alt.1 for HMS. Overfished fished species catch projections for the salmon troll fishery represent incidental fishing mortality. In 2005, salmon troll vessels are projected to encounter 1.6 mt or 33% of the canary rockfish taken in all OA fisheries, or 3.42% of the OY. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish are reduced. VMS deters mixed fishing strategies where vessels alter gear to catch groundfish within the RCAs. The risks of exceeding the OYs due to incursions by Dungeness crab is relatively low Indirect impacts Fishing effort and location data from the 1,453 vessel identified above could improve the understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl	Direct impacts Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of RCAs. The risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs is reduced for directed groundfish fisheries. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. Overfished species catch projections for the salmon troll fishery represent incidental fishing mortality. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish are reduced. VMS deters mixed fishing strategies where vessels alter gear to catch groundfish within the RCAs. In 2005, salmon troll vessels are projected to encounter 1.6 mt or 33% of the canary rockfish taken in all OA fisheries, or 3.42% of the OY. No change over Alt. 1 for HMS line and sea cucumber vessels because they are not projected to catch overfished species Indirect impacts Fishing effort and location data from the 1,583 vessels identified above could improve the understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl	Direct impacts The ability to maintain the integrity of the RCAs is slightly less than Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. 1,525 vessels are included under this alternative. Indirect impacts Increased data on fishing effort is slightly less than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.
Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl	Direct impacts The ability to maintain the integrity of the RCA is slightly less than Alt. 6A because approximately 22 vessels (those <12 feet in length) less than that identified under Alt. 6A are excluded. 1,561 vessels are included under this alternative. Few if any of these vessels are likely to fish in Federal waters. Indirect impacts Increased data on fishing effort is slightly less than that identified under Alt. 6A; approximately 22 vessels (those <12 feet in length) less than those identified under Alt. 6A are excluded. Few if any of these vessels are likely to fish in Federal waters.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact Data from vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels using directed groundfish pot gear; 40 vessels using CA halibut trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear (590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels) could be used to maintain the integrity of RCAs. The risk of actual catch exceeding the OYs for overfished species as the result of incursions into the RCAs is reduced for directed groundfish, and for those incidental fisheries that have the greatest potential for catching ovefished species. The risk of actual catch exceeding the OYs for overfished species is higher for nongroundfish trawl vessels than it is under Alt. 4A-7. Indirect impact Provides VMS position data from approximately 1,463 vessels, identified in the preceding paragraph, that can be combined with observer, survey, and fish ticket data to improve the understanding of groundfish mortality for pot vessels in the same ways as identified under Alt. 2 for longline vessels.

BIOLOGICAL ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
TOTAL CATCH	Changes in groundfish mortality levels as a result of VMS regulations
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impact Data from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab, 2 prawn and 2 sheephead); 9 vessels using CA halibut and 3 vessels using pink shrimp trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear (590 groundfish directed, 1 HMS and 6 salmon troll vessels) could be used to maintain the integrity of the RCAs. The risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs by directed groundfish vessels is reduced. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. Overfished species catch projections for the salmon troll fishery represent incidental fishing mortality. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish is greater than Alt. 5A-8 if vessels alter gear to catch groundfish within the RCAs. The risk of exceeding the bocaccio or canary rockfish OYs as a result of CA halibut vessel incursions into the RCAs is greater than Alt 4A-8. Indirect impact Provides VMS position data from approximately 1,123 vessels, identified in the preceding paragraph, that can be combined with observer, survey, and fish ticket data to improve the understanding of groundfish mortality for pot vessels in the same ways as identified under Alt. 2 for longline vessels.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact Overfished species catch is expected to increase for the directed fisheries, the non-groundfish trawl fisheries except pink shrimp, and the Pacific halibut fishery unless additional management measures, such as extended closed seasons, are used to restrict the fishery. Indirect impact Little data available to assess OA fishing location and intensity.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.2.1 Fishing mortality

Direct impacts on fishing mortality include changes in the mortality of target and non-target species (incidental catch). This action would expand the VMS program to the OA gear sectors to monitor fishing location in relation to time-area closures. Direct benefits result if the integrity of RCAs are maintained as a result of VMS requirements.

To monitor the attainment of OYs, the total catch level must be estimated for each species or species group. The fishing mortality level (total catch level) for each species is the sum of retained catch and discarded catch (incidental or targeted catch that is not retained and landed by the vessel). There is no exact measure of discard amounts in the OA fisheries. For all species except lingcod, sablefish, and nearshore rockfish species, it is assumed that discarded fish are dead or die soon after being returned to the sea. Total catch estimates of overfished species in the LE fisheries are currently based on a bycatch accounting model (for further information on current bycatch model see the preamble discussion in the proposed rules for the Harvest Specifications and Management Measures from 2003, 2004 and 2005-2006; January 7, 2003, 68 FR 936 or Section 3.3 of the EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery, addressed the physical impacts on the environment under status quo management.) which has applied depth-related discard assumptions since 2003. At this time, total catch estimates of overfished species taken in the OA fishery are based on landed catch from fish tickets, assumed discard rates, discard and discard mortality assumptions, expertise from state fisheries managers, and industry advisory body input. However, as observer and other data become available more formal bycatch modeling is expected to be used for a portion (directed) or perhaps all of the OA fisheries. The current bycatch model for the LE fisheries uses overfished species bycatch rates that are representative of fishing outside the RCAs, and would be higher if areas within the RCAs were included. An OA fishery bycatch model would likely be similar for the directed OA fisheries.

Discard assumptions used for modeling the fishery to estimate total catch of overfished species have been based on bycatch rates for areas where fishing is expected to occur. If the RCAs were not adequately maintained, landed catch would have higher bycatch rate associated with it than that assumed by the model. This is especially a concern for those overfished species that constrain the fisheries and for which the OY is fully attained each fishing year. If incursions into the RCAs occur, the estimated total mortality would likely be underestimated and the risk of exceeding the OYs for overfished species increased, with the risk being greatest for species most frequently encountered by the OA gears (bocaccio, lingcod, yelloweye rockfish and canary rockfish), which the RCAs are intended to protect. If the true discard rates are higher than the discard assumptions used to estimate total catch, the OYs could unknowingly be exceeded. If the OYs are substantially exceeded, a stock's ability to rebuild could be impaired. If a rebuilding deficit is created for an overfished stock because the OY is repeatedly and unknowingly exceeded, the stock may not be able to recover within the specified rebuilding time. For stocks in the precautionary zone (B25%-B40%), the stock biomass could be further reduced, possibly leading to an overfished status.

Indirect impacts from fishery management actions include changes in fishing practices that affect the biological environment, but are further away in time or location than those occurring as a direct impact. The prohibition of fishing in certain areas or during certain times is used to reduce overall fishing effort and to protect vulnerable populations. When depth-based RCA management was adopted, large areas of the continental shelf were closed to groundfish fishing to protect overfished species. This was expected to result in effort shifts to open areas that are shoreward and seaward of the conservation areas. Over time, area management involves closing and sometimes opening formerly closed areas. When the size or location of closed areas change, the fishing fleet makes shifts in fishing effort. Knowing when and where fishing is occurring is necessary for: understanding total fishing mortality; evaluating possible impacts on the adult and juvenile groundfish species, assessing impacts with non-groundfish species, and determining if regulatory changes are needed.

Commercial data is primarily in the form of landing receipts or "fish tickets," which are filled out by fish buyers at the time of delivery from a fishermen. Fish tickets are a major source of information on the amount of fish and which provide information on the total weight landed by species or market categories,

price per pound, and the condition of the catch. Little specific information on fishing locations is available for the OA fleet. Therefore, little is known about fishing patterns in the West Coast groundfish OA fishery or how fishing effort shifts from closed areas to the remaining open fishing areas.

Logbooks are a useful tool for verifying landing receipts and for tracking fishing activity. The information recorded in logbooks typically consists of date, boat name and identification number, crew size, catch location, numbers or pounds of fish, gear type used, mesh size, principle target species, associated species taken and landing receipt number. Logbook data is not available from the directed OA fisheries at this time, but are for a few incidental fisheries such as the California gill and trammel nets, traps, and trawl gear fisheries. Without effort data, estimates of catch per unit of effort (CPUE) cannot be made. CPUE is the number or weight of fish caught per unit of effort. Typically, effort is evaluated by gear type, gear size, and length of time the gear is used. CPUE can be used as a measure of relative abundance for a particular species and can be used to understand abundance changes over time. VMS can aid in estimating CPUE based on fishing location and days at sea.

VMS systems provide accurate harvest location data that could be used to estimate the distribution of fishing effort throughout the WOC. Hourly position reports allow changes in fishing location and intensity to be monitored and assessed, they also allow the number of vessel trips to be verified. Because VMS would be required to be operated continuously after a vessel fishes in the OA fishery in Federal waters, data from additional non-groundfish fisheries off the West Coast may also be available. When VMS position information can be combined with data collected by at-sea observers it can be used to better understand the impacts of the effort shift on adult and juvenile populations. Overfished species bycatch estimates may be refined with VMS data. The response time for management to address unintended impacts on stocks resulting from effort shifts could be improved with VMS. However, the ability to understand the extent of the impacts resulting from effort shifts on groundfish and other resources would depend on the amount, availability and applicability of other data such as at-sea observer data for the different gears and sectors of the OA fishery.

Comparison of the Alternatives The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the alternatives. Each of the alternatives defines the portion of the OA fleet that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Alternative 1, Status Quo, would continue the requirement for declaration reports from OA vessels using nongroundfish trawl gear in the RCAs. Under Alternative 1, OA fishery position data would only be available from vessels who voluntarily use VMS units and from vessels that fish pursuant to the OA regulations, but carry VMS because the vessel is registered to a LE permit. Under Alternative 1, a higher level of fishing mortality than that being used to estimate total catch may result if the integrity of closed areas are not maintained and incursions result in higher rates of overfished species catch than projected. The difficulty in maintaining the integrity of closed areas is greatest under status quo, Alternative 1.

Alternative 2 maintains the declaration provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) that use longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provides the least amount of data for monitoring the integrity of the RCAs or for assessing fishing effort and intensity relative to fishing fleet activity. The risk to overfished species as a result of incursions into the RCAs is reduced for the directed vessels using longline gear. Table 3.3.3.7 shows the projected catch of overfished species for 2005 for the OA directed groundfish and incidental fisheries. The Pacific halibut longline fishery is one of the incidental fisheries with the greatest potential impacts on overfished species if incursions into the RCA occur. The Pacific halibut fishery is projected to take 1.92% of the yelloweye rockfish OY with the RCAs being maintained. Having VMS to maintain the integrity of the RCAs in relation to Pacific halibut longline vessels will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. Data collected from the longline vessels can be combined with observer, survey, and fish ticket data to better

estimate: 1) total fishing mortality, 2) impacts on juveniles and other fishery resources related to changes in fishing locations and intensity, 3) fishing intensity (amount of time vessels are in an area), and 4) changes in fishing location and intensity over time. Given the mobility of vessels within the fishery, directed longline vessels could choose to change gears to avoid the VMS requirements.

Approximately 515 vessels would be required to have VMS under Alternative 3. Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) using pot gear to take and retain, possess or land groundfish. The addition of the pot gears to the VMS program under Alternative 3 will aid in maintaining the integrity of RCAs. Therefore, the risk to overfished species, as a result of incursions into the RCAs is reduced for the directed vessels using longline and pot gear. Table 3.3.3.7 shows the projected catch of overfished species for 2005 for the OA directed groundfish and incidental fisheries. When considering the impacts of the incidental pot fisheries on overfished species, the California sheephead pot fishery and the spot prawn trap fishery would be considered the lowest impact OA fisheries because no overfished species fishing mortality is projected for these fisheries, and the Dungeness crab pot fishery with 0.5 mt of lingcod (0.02% of the lingcod OY) would have only slightly greater impacts on overfished species. Some fisheries encounter fewer overfished species because the target species and the overfished species do not co-occur or occur in low abundance, or because the fishing gear is designed in a way that captures the target species but does not capture the overfished species. For such incidental fisheries, the potential risk of incursions into the RCAs (when incidental groundfish is retained or targeted within the RCA) is lower than for fisheries where the target species co-occur with overfished species or are vulnerable to the fishing gear. Table 3.3.3.1 shows that the groundfish landings in the Dungeness crab fishery and the prawn pot fisheries were very low between 2000 and 2004 (less than 0.3 mt per year). The groundfish landings by vessels targeting California sheephead were somewhat higher (2.0 in 2000, 4.8 in 2001, and 0.7 in 2003) in the years before RCAs were created. Similar to Alternative 2, under Alternative 3, some vessels may change to line gear to avoid the VMS requirements.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the pot and longline vessels identified under Alternative 3. The primary difference between Alternatives 4A and 4B is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear. While Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. Approximately 646 vessels would be required to have and use VMS under Alternative 4B. The nongroundfish trawl fisheries with the greatest impacts on overfished species include the pink shrimp and California halibut trawl (overfished species impacts were not provided by gear type) fisheries (Table 3.3.3.1). The California Halibut trawl fishery has a specific RCA defined for the fishery. The risk of actual catch of overfished species exceeding the OYs as a result of RCA incursions by California halibut vessels is reduced with VMS. RCA areas have also been defined for California sea cucumber and the ridgeback prawn trawl fishery. Under the current management regime, which includes RCAs, the sea cucumber trawl fishery would be considered the lowest impact OA trawl fisheries because no overfished species fishing mortality is projected for the fishery. The ridgeback prawn trawl fishery has a slightly greater impact with 0.1 mt of bocaccio (0.03% of the bocaccio OY) projected to be taken. Though the risk of actual catch of overfished species exceeding the OYs as a result of RCA incursions by sea cumber and ridgeback prawn trawl vessels is lower than for California halibut vessels, it is further reduced with VMS. Pink shrimp vessels must provide declaration reports when fishing within a trawl RCA, but are otherwise not subject to RCA restrictions. The effect of Alternatives 4A and 4B is the same because no overfished species catch projection would not change over current projections. Fishing effort and location data under both alternatives could provide information that can be used to better understanding groundfish mortality for trawl vessels in the same ways as identified under Alt. 2 for longline vessels.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 658 vessels (590 groundfish, 58 California halibut, and 10 HMS vessels) using line gear to take and retain, possess or land groundfish (excludes salmon troll vessels). In total,

alternative 5A applies to 1,250 vessels. The risk of actual catch exceeding overfished species OYs as a result if incursions into the RCAs is reduced for all directed groundfish vessels. Maintaining the integrity of the RCAs for nongroundfish trawl and line vessels will reduce the risk of exceeding the bocaccio or canary rockfish OYs as a result of California halibut vessel incursions into the RCAs. Under Alternative 5A, there is no change over Alternative 1 for HMS line vessels. Overfished species catch projections for the salmon troll fishery represent incidental fishing mortality. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs may be reduced. VMS data could also be used to improve managers' understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.

Alternative 5B, includes slightly more vessels than 5A because all salmon troll vessels that land groundfish are included. HMS and Dungeness crab vessels are excluded under alternative 5B. Data from 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) can be used to maintain the integrity of RCAs. In 2005, salmon troll vessels were projected to encounter 1.6 mt or 33% of the canary rockfish taken in all OA fisheries, or 3.42% of the canary rockfish OY (Table 3.3.3.7). The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs may be reduced. The risks of exceeding the OYs due to incursions by Dungeness crab is relatively low. VMS data could also be used to improve managers' understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels.

Alternative 6A, applies to any vessel engaged in commercial fishing to which an RCA restriction applies. Alternative 6A would apply to the largest number of OA vessels and would therefore provide the largest amount of data for monitoring the integrity of the RCAs. Data from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut) could be used to maintain the integrity of RCAs. Unlike Alternatives 2-5B, which include only Pacific halibut vessels that take and retain, possess or land groundfish, all Pacific halibut vessels would be included under Alternative 6A. Maintaining the integrity of the RCAs will reduce the risk of exceeding the yelloweye rockfish OY as a result of Pacific halibut vessel incursions into the RCAs. There is no change over Alternative 1 for HMS line and sea cucumber vessels because they are not projected to catch overfished species. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs may be reduced. Alternative 6B applies to any vessel engaged in commercial fishing to which an RCA restriction applies, except salmon troll vessels fishing north of 40°10' N. lat. that land only yellowtail rockfish. Alternative 6B affects approximately 58 fewer vessels annually than does Alternative 6A. The risk of incursions into the RCAs occurring under Alternative 6B are similar to Alternative 6A, with the only difference being the ability to monitor the fishing locations of salmon troll vessels fishing in the north that retain only yellowtail rockfish. Impacts resulting from Alternative 7 are almost the same as Alternative 6A because it applies to the same vessels, except that 22 vessels less than 12 feet in length would be excluded. It is unlikely that vessels under 12 feet in length fish in Federal waters and would therefore not trigger the VMS requirement. VMS data could also be used to improve managers' understanding of groundfish mortality for line vessels in the same ways as identified under Alt. 2 for longline vessels. The benefits of position data availability should be considered in the longer term because there is currently very little data (observer or otherwise) from OA vessels on the amounts and types of bycatch in their fisheries. In the short-term, using effort data obtained from a VMS system to estimate total catch and to monitor the attainment of OYs will be limited until more data becomes available.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn

trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using California halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Data from the seas cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8. Therefore, the ability to maintain the integrity of RCAs from incursions with the fishing gears associated with the greatest projected catch of overfished species would result in impacts similar to Alternatives 5B-7. Because the low projected bycatch for the sea cucumber and ridgeback prawn trawl fisheries are linked to the areas which the fisheries occur, the lack of VMS for these vessels may undermine the integrity of the nongroundfish trawl RCAs that are used to managed the catch of overfished species by these vessels.

Under alternative 9 data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab, 2 prawn and 2 sheephead); 9 California halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8, as well as very few California halibut line gear, and salmon troll vessels. The overfished species impacts projected for the California halibut fishery are 0.03% of the bocaccio OY, 0.21% of the canary rockfish OY, and 0.08% of the lingcod OY, however these are not gear specific projections. The California halibut trawl fishery has a specific RCA defined for the fishery. The risk of actual catch of overfished species exceeding the OYs as a result of RCA incursions by California halibut vessels is greater under Alternative 9 than under Alternatives 2-3, but less than 4A-8. The risk of exceeding the OYs for canary rockfish, lingcod, bocaccio, widow or yelloweye rockfish as a result of salmon troll fishing where the gear is altered or used to catch groundfish within the RCAs is likely to be reduced and is similar to Alternatives 2-5A. Small amounts of incidentally caught species may continue to be landed rather than discarded by the vessels to avoid VMS requirements. Providing managers with an opportunity to collect length and age structure data from species that may otherwise not be available.

The projected impacts resulting from Alternative 10 on overfished species catch is expected to increase for the directed fisheries, the non-groundfish trawl fisheries except pink shrimp, and the Pacific halibut fishery unless additional management measures, such as extended closed seasons, are used to seriously restrict the fishery. Little data is available to assess OA fishing location and intensity.

The OA fishery does not require participants to have permits or gear endorsements. Directed groundfish participants using fixed gear have the mobility to choose between the legal OA fixed gears for harvesting groundfish. Therefore, if VMS requirements under Alternative 2 or 3 were implemented, it will likely result in some directed groundfish participants changing gear to avoid the VMS requirements. Because a substantial proportion of the directed groundfish fleet is required to use VMS under Alternatives 4-9, the number of directed groundfish vessel operators that are likely to change gear to avoid VMS requirements is reduced. Vessels that incidentally catch groundfish while targeting other species are less likely to change gears to avoid VMS requirements. This is because the various state and federal requirements for the target fishery they are participating in generally restricts the type of gear participants can use. However, participants that catch groundfish incidentally with longline, pot, line, or net gear are not considered to be in the OA groundfish vessels unless they take and retain, possess or land groundfish. This is different from the nongroundfish trawl gear vessels. Therefore, these participants may choose to avoid the VMS requirements by not retaining groundfish, though they would continue to catch groundfish incidentally to the target fishery. The number of participants that would choose to discard groundfish to avoid VMS requirements is unknown; however, a substantial number of participants in the incidental groundfish fisheries land less than 500 lb of groundfish annually (Table 3.3.3.9) and may choose to avoid VMS requirements by discarding the groundfish catch. This type of VMS avoidance would likely occur more frequently with California halibut longline and line gear vessels, Dungeness crab pot vessels, prawn pot vessels, HMS line gear vessels, and salmon troll gear where a large number of vessels land less than 500 lb of groundfish per year. These vessels are excluded under Alternative 8 and 9. Nongroundfish

trawl vessels have less ability of avoid VMS since all vessels, regardless of whether or not groundfish are landed, are included under Alternatives 4A through 7.

4.2.2 Other Biological Resources

Non-groundfish species interactions
The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the management alternatives is expected to have an adverse effect on the incidental mortality levels of CPS, Dungeness crab, Pacific pink shrimp, Pacific halibut, forage fish or miscellaneous species over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 2- 7) may be positive because it may allow NMFS observer data and data from other sources to be joined together to derive a better understand of potential fishing related impacts on these species.

Salmonids
The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the management alternatives is expected to have an adverse effect on the incidental mortality levels of listed salmon species over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Marine Mammals
The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities The West Coast groundfish fisheries 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 (potential biological removal for mammal species). Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Seabirds
The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the proposed management alternatives are likely to affect the incidental mortality levels of seabirds over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Sea Turtles
The action is to expand the VMS program to monitor the integrity of closed areas in relation to OA fishing activities. None of the proposed management alternatives are likely to affect the incidental mortality levels of sea turtles over what has been considered in previous NEPA analyses. Information on where fishing effort is occurring (Alternatives 3- 7) may have a positive effect because it could be joined with NMFS observer data and data from other sources to derive a better understand of potential fishing related impacts on these species.

Endangered Species
Species listed under the ESA are identified in Section 3.2 of this EA. Specific discussion of species listed under the ESA can be found above in the sections titled salmonids, marine mammals, sea birds and sea turtles.

4.3 Socio-economic Impacts

This section of the EA looks at impacts, positive and negative, on the socio-economic environment. Basic information regarding the people and the fisheries that are projected to be affected by the management alternatives was presented in Section 3 of this document. The following section differs in that it discusses what is projected to happen to the affected people, what social changes are expected to occur, and, how changes are expected to affect fishing communities. Changes in harvest availability to the different sectors of the fishery, changes in income and revenue, costs to participants; the effectiveness and costs of enforcing the management measures, effects on fishing communities, and how the actions affect safety of human life at sea will be examined in the following impact analysis.

Circumstances vary substantially between OA target fisheries and gear groups. In addition, little social and economic information is available on the various OA fisheries and the participants. Therefore, it is not possible to produce a detailed cost benefit study for VMS implementation in the OA fishery. The following analysis takes a general approach by examining; the costs and benefits to the OA fishery participants that are likely to result from the alternative VMS actions relative to economic status of the fishery participants; the ecological health of the resources; the geographical nature of the fishery; the type of fishing conducted (directed or incidental); the type of gear used; the quantity and size of vessels; fisheries enforcement; the management regime; and safety of human life at-sea.

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 1 Status quo	Direct impact Declaration reports may aid in identifying OA trawl vessels legally fishing in conservation areas. Indirect impacts The RCAs may need to be simplified to be more enforceable.
Alternative 2 Vessels using longline gear	Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut vessels) that take and retain, possess or land OA groundfish. Deterrent effect will likely reduce the number of area violations by vessels using OA longline gear. Can be used to target at-sea and dockside inspections of OA vessels using longline gear. Indirect impact VMS position data from 322 longline vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the Pacific Halibut directed fishery.
Alternative 3 Vessels using longline or pot gear	In **addition** to the impacts from the 322 vessels under Alt. 2: Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relationship to approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead vessels) vessels using pot gear that take and retain, possess or land groundfish. Deterrent effect will likely reduce the number of area violations by vessels using OA pot gear. Can be used to target at-sea and dockside inspections of OA vessels using pot gear. Indirect impact VMS position data from 322 longline and 193 pot vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the Dungeness crab and spot prawn pot fisheries.
Alternative 4A Vessels using longline, pot or trawl gear, except: pink shrimp trawl	In **addition** to impacts from the 515 vessels under Alt. 2 and 3: Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear to take and retain, possess or land OA groundfish. Deterrent effect will likely reduce the number of area violations by vessels using nongroundfish trawl gear. Can be used to target at-sea and dockside inspections of OA vessels using nongroundfish trawl gear. Indirect impact VMS position data from 322 longline, 193 pot, and 77 trawl (except shrimp trawl) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the ridgeback prawn, sea cucumber, and CA halibut fisheries excluding pink shrimp.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts from the 515 vessels under Alt. 2 and 3: Direct impact Accurate and timely position data allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 131 vessels (54 pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear. Deterrent effect will likely reduce the number of area violations by vessels using nongroundfish trawl gear. No change over Alt. 4A for pink shrimp vessels because fishing in the RCA is permitted. Can be used to target at-sea and dockside inspections of OA vessels using nongroundfish trawl gear. Indirect impact VMS position data from 322 longline, 193 pot, and 131 trawl vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities, and; may be used to support enforcement actions for closed area management in the ridgeback prawn, sea cucumber, and CA halibut fisheries.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	In **addition** to impacts from the 592 vessels under Alt. 2, 3 and 4A, Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to approximately 658 (590 vessels using line gear to target groundfish, 10 HMS, and 58 CA halibut OA vessels) using line gear to take and retain, possess or land groundfish. Deterrent effect will likely reduce the number of area violations by vessels using line gear. Can be used to target at-sea and dockside inspections for OA vessels using line gear. Indirect impact VMS position data from 320 longline,193 pot, 77 trawl (except shrimp trawl), and 658 line (except salmon troll) vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and may be used for closed area management in the line fisheries excluding salmon troll.
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline, HMS line, and Dungeness crab pot gear	Direct impact Accurate and timely position data will allow enforcement resources to be used efficiently to maintain the integrity of RCAs in relation to 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels). Deterrent effect will likely reduce the number of area violations for incidental OA fisheries including salmon fishery area management measures. Can be used to target at-sea and dockside inspections for OA vessels Indirect impact VMS position data from 320 longline (excludes 2 HSM vessels), 172 pot (excludes 21 Dungeness crab vessels), 77 trawl (excludes shrimp trawl), and 882 line (includes 234 salmon troll vessels but excludes 10 HMS vessels), may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries excluding pink shrimp, HMS longline, HMS line and Dungeness crab pot fisheries, but including salmon troll.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 6A Vessels with RCA restrictions; except pink shrimp trawl	Direct impact Accurate and timely position data available from approximately 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear (145 directed groundfish, 6 prawn, 21 Dungeness crab and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels) and 72 vessels using net gear (25 HMS and 47 CA halibut). Deterrent effect will likely reduce the number of area violations for OA incidental fisheries including the salmon fishery. Can be used to target at-sea and dockside inspections for all OA vessels with RCA restrictions, including salmon troll coastwide. Indirect impact VMS position data from 349 longline, 193 pot, 77 trawl, and 892 line vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions, including salmon troll.
Alternative 6B Vessels with RCA restrictions: except salmon troll north that retain only yellowtail rockfish and pink shrimp trawl	Direct impact Slightly less accurate and timely position data than identified under Alt. 6A, because 58 salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded Indirect impact VMS position data from 349 longline, 193 pot, 77 trawl, and 834 line vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.
Alternative 7 Vessel >12 ft with RCA restriction; except, pink shrimp trawl	Direct impact Slightly less accurate and timely position data than identified under Alt. 6A because approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels <12 feet in length) fewer vessels (1,383 vessels) than those identified under Alt. 6A are excluded. Few if any of these vessels fish in Federal waters. Indirect impact VMS position data from 343 longline, 191 pot, 77 trawl, and 878 line vessels: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact Accurate and timely position data available from 1,463: 349 vessels using longline gear 282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 CA halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels). Deterrent effect will likely reduce the number of area violations by vessels identified under this alternative. Indirect impact VMS position data from the 1,463 vessels identified under this alt.: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY ENFORCEMENT	Changes in the ability to enforce groundfish fishery regulations as a result of VMS regulations
Alternative 9 Directed vessels, those that land more than 500 lb of groundfish in a calendar year.	Direct impact Accurate and timely position data available from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 CA halibut and 3 pink shrimp vessels (2003-2004 avg. number)using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Deterrent effect will likely reduce the number of area violations by vessels identified under this alternative. Indirect impact VMS position data from the 1,123 vessels identified under this alt.: may be used as basis for enforcement actions; may be used to establish probable cause for investigations; may be beneficial to homeland security activities; and; may be used for closed area management in the in OA incidental fisheries with RCA restrictions.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact Enforcement of OA fishery interactions with RCAs would no longer be necessary. Indirect impact Scarce enforcement resources may be used elsewhere to monitor for potential fishery violations other than those related to the OA fishery interactions with RCAs.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.3.1 Fishery Enforcement

Direct impacts on enforcement from fishery management actions includes; changes in the availability of information that directly aids enforcement officers in identifying violations; changes in information that helps enforcement officers to separate those individuals who are complying with the regulatory requirements from those who are not; and changes that alter the level of compliance by fishers.

At the present time there are 8 NMFS agents covering the Pacific Coast groundfish fishery. These officers and agents are responsible for enforcing all conservation regulations in the Pacific Coast groundfish fishery (e.g. size limits, trip limits, gear restrictions, etc). They are also responsible for monitoring all other fisheries in areas that are regulated by NMFS. In addition, there are state enforcement officers in California, Oregon, and for Washington that cover the groundfish fishery as well as other state fisheries. At this time, state enforcement resources (personnel and budgets) are extremely limited.

Implementing depth-based management measures over large geographic areas marked the transition to a much greater dependence upon at-sea enforcement. Maintaining the integrity of the conservation areas is largely dependent upon the ability to enforce such management measures. In the past, fishery management measures, such as landing limits, size limits, and species landing restrictions were largely enforced by the relatively easy and inexpensive method of dockside enforcement. Enforcing depth-based closed areas represents a more costly and difficult challenge, because effective enforcement requires frequent patrolling of the shoreward and seaward boundaries of the conservation areas. The single biggest factor that allows some operators to avoid compliance with closed area management measures is that much of the fishing activity takes place out of view of anyone other than the vessel crew. Because VMS provides reliable and accurate information on the location of vessels and can be used to identify where fishing activity takes place with a reasonable degree of accuracy, VMS is a practical means of monitoring vessels activity in relation to area restrictions.

VMS will potentially show enforcement officers breaches of time/area restrictions. VMS can show officers those vessels that are following the rules as well those that are not. In doing so, it makes the activities of investigating officers much more cost effective because less time will be spent pursuing false trails and fishing operators who are following the rules. However, patrols by both sea and air will still be necessary for fully effective monitoring and management, even with an effective VMS program. A patrolling aircraft or vessel can spend considerable time and fuel investigating legitimate fishing vessels that will appear on their radar. Providing access to VMS data for patrol craft can minimize the effort spent confirming radar contacts of vessels fishing legitimately and thereby increase the efficiency of surveillance patrols. Further, identifying legitimate fishing vessels to patrol craft via VMS may help them choose particular contacts for more productive investigation when several contacts are made by radar.

In some cases, enforcement officers will have particular vessels or particular situations for which they may wish to conduct an at-sea or landing inspection without warning to the vessel operator. Without VMS, it is extremely difficult to determine where a vessel is located at-sea or where and at what time it might enter port. VMS provides a reliable means of achieving this with potential savings in time and other expense in moving officers and aircraft or patrol vessels to the correct location at the appropriate time.

Vessel position data and fishery declarations, which are otherwise not available from this sector of the groundfish fleet, would be used to identify vessels fishing in the closed areas and to target landing and at-sea inspections. Accurate and timely position data is necessary to allow enforcement resources to be used efficiently to maintain the integrity of RCAs. In addition, the deterrent effect of VMS will likely reduce the number of closed area violations.

One of the major benefits of VMS is its deterrent effect. If fishing vessel operators know that they are being monitored and that a credible enforcement action will result from illegal activity, then the likelihood of that illegal activity occurring is significantly diminished. In this context, VMS is a preventive measure rather than a cure. To be effective as a deterrent, the VMS program must maintain its credibility in the

eyes of the vessel operators and its use must be kept at the forefront of their minds if the deterrent effect is to be maintained. The credibility of the system can only be maintained if all operational issues are followed up, particularly those that affect a vessel, such as failure of the vessel to report on schedule. The presence of the VMS equipment on the vessel will be a reminder to operators of its monitoring operation.

The OA fleet consists of smaller sized vessels, with many being under 40 feet in length (Table 3.3.3.4). Smaller vessels are generally not able to withstand rough seas as well as larger vessels. Because much of the OA groundfish fleet is comprised of small vessels, much of the effort is thought to occur in waters near the seaward boundary of the nontrawl RCAs. It is presumed that fishers with smaller vessels (<40 ft) fishing seaward of the RCAs are more likely to encroach on the seaward boundary of the RCAs, because of the desire to fish nearer to shore for safety and to reduce fuel consumption and general wear and tear on the vessel. Table 4.3.1.1 shows the proportion of OA vessels by target fishery that are less than 40 feet in length. From this table, it can be seen that a large portion of the vessels that participate in the directed fisheries and who have a greater than 5% dependency on groundfish are small vessels. Many of the nearshore vessels may fish exclusively in state waters.

Table 4.3.1.1. Percent of OA vessels less than 40 feet (ft) in length, November 2000 through October 2001.

More than 5% of annual revenue from groundfish	
Target species	Vessel less than 40 ft in length
Sablefish	72%
Nearshore Rockfish	91%
Shelf Rockfish	90%
Slope rockfish	82%
Less than 5% of annual revenue from groundfish	
Sablefish	32%
Nearshore Rockfish	78%
Shelf Rockfish	60%
Slope rockfish	51%
Halibut	65%
Shrimp/prawn	21%
Dungeness crab	56%
Salmon	72%
HMS	31%
CPS	29%
Source: EIS, for the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management 2005-2006	

Indirect impacts on enforcement from fishery management actions include change in the availability of

information used for conducting further investigations or used with other sources of information to better understand compliance behavior.

VMS positions can be efficient in identifying possible illegal fishing activity and can provide a basis for further investigation by one or more of the traditional enforcement measures. VMS positions in themselves can also be used as the basis for an enforcement action. The positions may also be used to establish "probable cause" before pursuing some types of investigations, for example, in obtaining a search warrant. While not being evidence of sufficient significance by itself, VMS position data could provide sufficient evidence to lead an officer to believe that an illegal act had occurred that warrants further investigation.

Expansion of the VMS program clearly supports an enforcement mission and may also have indirect benefits to Homeland Security activities. Increased border security correlates directly with increased risk within our EEZ and along our coastline for illegal entry. In March 2002, the "Citizen Corps" initiative was announced, which includes the expansion of "Neighborhood Watch" to include the participation of ordinary citizens in detecting and preventing terrorism. Under "Coastal Watch", the Coast Guard requests fishers to report suspicious activities for investigation and intelligence purposes. Critical decisions on the deployment of enforcement assets could be based on VMS position reports. Satellite communication could also update essential information during a law enforcement response. Investigative methodologies could be enhanced via surveillance data maintained within VMS, such as easily identifying potential witnesses to incidents, locating U.S. vessels in areas of suspicious activity for assistance and support and increased intelligence gathering capabilities. By expanding the number of U.S. fishing vessels operating with VMS, NOAA and fishers are expanding the capability to detect and prevent terrorism and other criminal activity in the EEZ. VMS also supports the Coast Guard's "Coastal Watch" initiative, which was developed in response to their homeland defense activities.

Comparison of the Alternatives

VMS would not replace or eliminate traditional enforcement measures such as aerial surveillance, boarding at-sea via patrol boats, landing inspections and documentary investigation. Traditional enforcement measures may need to be activated in response to information received via the VMS. The level of VMS coverage in the OA fleet varies between the alternatives. Therefore, the degree to which a VMS program would aid enforcement in identifying vessels that are legally or illegally operating in the RCAs or benefit enforcement in conducting further investigations, would depend on the proportion of vessels required to carry and use VMS as well as the amount of time the vessels engage in fisheries in areas with the RCA restrictions.

Alternative 1 requires nongroundfish trawl vessels to provide declaration reports prior to leaving port on a trip in which fishing occurs in an RCA. Under Alternative 1, OA fishery position data would be available from vessels that voluntarily use VMS units and from vessels that fish pursuant to the OA regulations, but carry VMS because the vessel is registered to a LE permit. The greatest difficulty in maintaining the integrity of closed areas and the least efficient use of limited state and federal enforcement resources occurs under status quo, Alternative 1.

Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 longline vessels (282 directed groundfish, 38 Pacific halibut, and 2 California halibut vessels) using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provides the least amount of data for monitoring incursions. If the groundfish species pursued by the directed longline vessels are in high abundance in the RCA (primarily shelf areas,) fishers may be willing to take the risk to fishing within the boundaries of the RCA particularly if the rate of detection is low. Because Pacific halibut are also found within the RCAs, some fishers may be willing to risk fishing within the RCAs, particularly if the perception of being detected is low. In recent years, the directed halibut fishery south of Point Chehalis has occurred in 3-6 one day 10 hour long openings per year. Given the short duration of the directed halibut fishery, requiring the Pacific

halibut vessels that retain groundfish to have VMS would provide a large amount of position data over a very short period of time. Some fishers, those who do not otherwise fish in the groundfish fishery and who only land small amounts of incidentally caught groundfish caught during the primary halibut season, may well choose to discard incidentally caught groundfish, rather than incur the cost of VMS and the burden of installation. HMS longline gear is currently not permitted in the EEZ off the West Coast; therefore, no additional HMS vessels over those affected by status quo would be included as a result of Alternative 2. Because the fishery occurs outside the RCA, HMS longline vessels would transit through the RCA and therefore pose a minimal risk to the integrity of the RCAs. Monitoring HMS longline vessels in relation to the RCA requirements is a lower priority to enforcement.

Alternative 3 includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for vessels using pot gear that take and retain, possess or land OA groundfish. Approximately 515 vessels, those identified under Alternative 2 plus approximately 193 vessels using pot gear (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead) would be included under Alternative 3. Alternative 3 would provide more data position reports than Alternative 2, however it would provide fewer position reports than Alternative 4A. A small proportion of the Dungeness crab vessels, less than 3% (21 vessels per year out of 801 vessels per year), land the groundfish incidentally taken during the Dungeness crab season. Landing groundfish taken in Dungeness crab pots is not allowed in the states of Washington and XXOregonXX. The Dungeness crab fishery primarily occurs in depths between 5-100 fathoms of water. When the nontrawl RCAs extend from shore to 100 fm, any groundfish retained by a pot vessel fishing for Dungeness crab would be required to have been caught seaward of the 100 fm line. In addition, regulations prohibit vessels from fishing both shoreward and seaward of the RCA on the same trip. VMS could be used to determine if all fishing on a trip in which groundfish was retained occurred seaward of the RCA, or if fishing actually occurred within the RCA on trips in which groundfish was landed. Because few if any vessels target Dungeness crab offshore of 100 fm, Alternative 3 is expected to affect few Dungeness crab vessels. This would not be an issue for nontrawl RCA areas that are defined by a shoreward fathom curve that is seaward of areas where Dungeness crab fishing occurs. VMS would aid enforcement in maintaining the integrity of the shoreward boundary. However, Table 3.3.3.9 shows that the majority of Dungeness crab vessels landing groundfish between 2000 and 2004 have landed less than 100 lb of groundfish in an entire year. Therefore, it is likely that many if not all of the 21 vessels per year that land groundfish, would discard the groundfish to avoid the VMS requirements. Between 2000 and 2004, Table 3.3.3.1 shows that these vessels landed about 0.3 mt of groundfish with an exvessel value of 1,104 per year.

The California nearshore fisheries include vessels that use traps or pot gear to harvest species managed under the groundfish plan as well as non-groundfish such as California Sheephead and Scorpionfish. Of the 68 vessels per year that landed sheephead, 21 vessels retained OA groundfish. Because the nearshore fishery primarily occurs in state waters, it is likely that many of these vessels would not be subject to the VMS requirements; therefore, no VMS position data would be available to enforcement from these vessels. The OA nontrawl RCA between 40°10 and 34°27 N. lat. has a seaward boundary of 150 fm year-round and a shoreward boundary of 20 fm during the summer (May-August) and 30 fm for the remainder of the year. Similarly, the proposed OA nontrawl RCA south of 34°27 N. lat. has a seaward boundary of 150 fm year-round and a shoreward boundary of 60 fm throughout the year. When the shoreward boundary is deeper than 20 fm, it is likely that some vessels will enter the EEZ to fish and be required to carry VMS for the remainder of the year. During the period when the fishery is constrained to 20 fm, there may be a greater incentive for some fishers to harvest nearshore species in deeper water. VMS would be an effective deterrent to illegal fishing in the RCAs. Traditional enforcement measures will likely continue to be the dominant enforcement tool used for monitoring the integrity of the RCAs shoreward line, particularly north of 34°27 N. lat. In the area south of 34°27 N. lat, there may be more incentive for vessels to fish in the EEZ because the shoreward boundary of the RCA extends further into the EEZ. Between 2000 and 2004, Table 3.3.3.1 shows that the California sheephead vessels landed about 1.5 mt of groundfish per year with an exvessel value of $14,558 per year.
Of the 28 vessels per year that landed prawns taken with pot gear, 6 vessels per year retained OA groundfish. Between 2000 and 2004, Table 3.3.3.1 shows that these vessels landed about 0.1 mt of

groundfish per year with an exvessel value of $949 per year. Table 3.3.3.9 shows that the amount of groundfish landed by prawn vessels between 2000 and 2004 varied, with most vessels landing less than 500 lb per year. However, between 1 and 4 vessels per year landed more than 500 lb of groundfish per year. It is likely that most if not all of the vessels that land less than 500 lb per year of groundfish, would discard the groundfish to avoid the VMS requirements.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to those vessels identified under Alternative 3. The primary difference between the two alternatives is that Alternative 4A excludes pink shrimp and adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear. Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4B, plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. Having VMS would be expected to be an effective deterrent and aid enforcement in maintaining the integrity of the shoreward line of the RCAs. Because the overfished species impacts projected for the California halibut fishery are 0.03% of the bocaccio OY, 0.21% of the canary rockfish OY, and 0.08% of the lingcod OY, the fishery was considered a higher impact OA incidental fishery. The ridgeback prawn trawl fisheries is considered to have slight impacts on overfished species (defined as those fisheries that take only a single overfished species, with small amounts by weight and proportion of the available OY -less than 0.05%,) given the current management regime, which includes RCA management. Similarly, the sea cucumber trawl fishery is considered one of the lowest impact OA fisheries because no overfished species catch is projected under the current management regime which includes RCAs. Alternative 4B results in no change over Alternative 4A for monitoring incursions into the RCAs because pink shrimp vessels are permitted to fish in the RCA.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 1,250 vessels, those identified under Alternatives 2, 3,and 4 plus 590 directed groundfish, 58 California halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). During the period when the fishery is constrained to 20 fm there may be a greater incentive for some fishers to harvest in deeper water. VMS would be an effective deterrent to illegal fishing in the RCAs. As stated above, traditional enforcement measures will likely continue to be the dominant enforcement tool used for monitoring the integrity of the RCA shoreward line, particularly north of 34°27 N. lat. In the area south of 34°27 N. lat, there may be more incentive for vessels to fish in the EEZ because the shoreward boundary of the RCA extends further into the EEZ. Alternative 5B includes slightly more vessels than 5A at 1,453. Although 10 HMS line and 21 Dungeness crab vessels are excluded under Alternative 5B, 234 salmon troll vessels are included. The inclusion of line vessels more than doubles the number of vessels that would be required to have and use VMS. Though this is a large increase in vessels, the system developed for LE vessels already has the capacity to process these position data. Table 3.3.3.9 shows that the majority of line vessels landing groundfish in the OA incidental fisheries using HMS line, California halibut line and the salmon troll gear between 2000 and 2004 have landed less than 100 lb in an entire year. Therefore, it is likely that many of these vessels would discard the groundfish to avoid the VMS requirements.

In general, VMS is an efficient enforcement tool for monitoring if a fishing trip occurred entirely inside or outside an RCA. Using VMS in this way would allow enforcement to determine which cumulative trip limits applied to a particular vessel. However, for salmon troll vessels north of 40°10 N. lat., there has been an allowance to retain yellowtail rockfish only on a trip that occurred both inside and outside and RCA. VMS would be most suited for monitoring cumulative trip limits of groundfish species other than yellowtail rockfish taken and retained by salmon troll vessels north of 40°10 N. lat.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of OA vessels, 1,583 vessels. Therefore, Alternative 6A would provide the largest amount of data for enforcement purposes. Including most vessels in the VMS program could be expected to result in time savings for officers in the field and allow them time to conduct more

focused investigations than would otherwise be possible. Alternative 6B affects approximately 1,525 vessels annually, 58 fewer than does Alternative 6A. Alternative 7 is essentially the same as Alternative 6A, 1,561 vessels, because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most if not all of the 22 vessels that are under 12 feet in length are unlikely to fish in Federal waters and would therefore not trigger the VMS requirement.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels) would be available to enforcement. Data from the sea cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8. The enforcement benefits of this alternative are similar to Alternative 6A except that the exclusion of many nongroundfish trawl vessels where there are specific RCA requirements may result in undetected incursions, with the exception of the pink shrimp fishery.

Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8. Under Alternative 9, data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Many of the longline, pot, and line gear vessels that may choose to avoid VMS by discarding bycatch would be excluded under Alternative 9. Therefore the actual benefit to enforcement is similar to Alternatives 5A-7 for these vessels. The exclusion of many nongroundfish trawl vessels may also result in undetected incursions, with the exception of the pink shrimp fishery for which there are no RCA requirements. The benefit to enforcement for nongroundfish trawl is similar to Alternatives 1-3 for these vessels.

Alternative 10, the no action alternative, would have no VMS requirements, but the use of RCA management would be discontinued and management measures such as trip limits and closed seasons would be used to reduce the catch of overfished species. Enforcement of OA fishery interactions with RCAs would no longer be necessary. Scarce enforcement resources may be used elsewhere to monitor for potential fishery violations other than those related to the OA fishery interactions with RCAs.

The OA fishery does not require participants to have permits or gear endorsements. Directed groundfish participants using fixed gear have the mobility to choose between the legal OA fixed gears for harvesting groundfish. Therefore, if VMS requirements under Alternative 2 or 3 were implemented, it will likely result in some directed groundfish participants changing gear to avoid the VMS requirements. Because a substantial proportion of the directed groundfish fleet is required to use VMS under Alternatives 4-9, the number of directed groundfish vessel operators that are likely to change gear to avoid VMS requirements is reduced. Vessels that incidentally catch groundfish while targeting other species are less likely to change gears to avoid VMS requirements. This is because the various state and federal requirements for the target fishery they are participating in generally restricts the type of gear participants can use. However, participants that catch groundfish incidentally with longline, pot, line, or net gear are not considered to be in the OA groundfish vessels unless they take and retain, possess or land groundfish. This is different from the nongroundfish trawl gear vessels. Therefore, these participants may choose to avoid the VMS requirements by not retaining groundfish, though they would continue to catch groundfish incidentally to the target fishery. The number of participants that would choose to discard groundfish to avoid VMS requirements is unknown; however, a substantial number of participants in the incidental

groundfish fisheries land less than 500 lb of groundfish annually (Table 3.3.3.9) and may choose to avoid VMS requirements by discarding the groundfish catch. This type of VMS avoidance would likely occur more frequently with California halibut longline and line gear vessels, Dungeness crab pot vessels, prawn pot vessels, HMS line gear vessels, and salmon troll gear where a large number of vessels land less than 500 lb of groundfish per year. These vessels are excluded under Alternatives 8 and 9. Nongroundfish trawl vessels have less ability of avoid VMS since all vessels, regardless of whether or not groundfish are landed, are included under Alternatives 4A through 7.

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 1 Status quo	Direct impact The use of area management regulations may need to be simplified, or buffers around closed areas added so the integrity of closed areas can be maintained. The use of management regulations that limit the duration or number of trips are less likely to be considered without adequate monitoring mechanisms. Indirect impact Little position and effort data is available from OA fisheries. Without adequate position and effort data, the use of observer and survey data for refining OA fishery total catch estimates for inseason management is limited. Non-groundfish fisheries continue to occur in the RCA, but incidental groundfish landings other than yellowtail rockfish in the salmon troll fishery north of 40°10' N. lat. cannot be retained or landed. Similarly, if a vessel fishes in the RCA on a trip, groundfish cannot be retained from areas outside the RCAs on the same trip. Some vessels may misreport catch for areas other than where it was caught.
Alternative 2 Vessels using longline gear	Direct impact VMS would allow for greater flexibility in the use of management rules with geographical area restrictions including: seasonal access, closed areas, depth restrictions, limited by duration, or number of trips for approximately 320 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut OA vessels) using longline gear to take and retain, possess or land OA groundfish. VMS will provide accurate longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management. Indirect impact Increased OA longline position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. VMS may result in increased bycatch and lost landings data if incidental groundfish catch by Pacific halibut vessels is not retained. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements. HMS longline gear is currently prohibited in EEZ.
Alternative 3 Vessels using longline or pot gear	In **addition** to impacts from the 322 vessels identified under Alt. 2: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 CA sheephead vessels) using pot gear to take and retain, possess or land OA groundfish. VMS will provide accurate pot and longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, possibly Dungeness crab, prawn, and CA nearshore species management. Indirect impact Increased longline and pot position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 4A Vessels using longline, pot or trawl gear, except pink shrimp trawl	In **addition** to impacts from the 515 vessels identified under Alt. 2 and 3: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut OA vessels using nongroundfish trawl gear take and retain, possess or land OA groundfish. VMS will provide accurate pot, longline and nongroundfish trawl (except pink shrimp) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, and CA halibut management. Indirect impact Increased longline, pot and nongroundfish trawl position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.
Alternative 4B Vessels using longline, pot or trawl gear	In **addition** to impacts from the 515 vessels identified under Alt. 2 and 3: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 646 vessels: 131 vessels (54 pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut) using nongroundfish trawl gear. VMS will provide accurate pot, longline and nongroundfish trawl fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, and CA halibut management. No change over Alt.4A for pink shrimp vessels. Indirect impact Increased longline, pot and nongroundfish trawl position and effort data from 646 vessels could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll.	In **addition** to impacts from the 592 vessels identified under Alt. 2, 3, and 4: Direct impact VMS would allow for greater flexibility in the use of management rules for approximately 658 vessels (590 groundfish, 58 CA halibut, and 10 HMS vessels) using line gear to take and retain, possess or land OA groundfish. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear (except salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, HMS and CA halibut management. Indirect impact Increased longline, pot and nongroundfish trawl position and effort data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.	Direct impact 1,453 vessels: 322 vessels using longline gear (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut); 172 vessels using pot gear (145 directed groundfish, 6 prawn, and 21 CA sheephead); 77 vessels using nongroundfish trawl gear (23 ridgeback prawn, 14 sea cucumber, and 40 CA halibut vessels), and 882 vessels using line gear (590 groundfish directed, 58 CA halibut, 10 HMS vessels, and 234 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, prawn, and CA nearshore species, prawn, sea cucumber, and CA halibut management. Indirect impact VMS data from vessels identified under Alt. 2, 3, 4, and 5A (excluding Dungeness crab and HMS vessels) plus approximately 234 salmon troll vessels could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.
Alternative 6A Vessels with RCA restrictions	Direct impact VMS would allow for greater flexibility in the use of management rules for 1,583 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear identified under Alt. 3; vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 CA halibut vessels); 892 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide); and 72 vessels using net gear (25 HMS and 47 CA halibut). VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management, Dungeness crab, prawn, HMS, CA nearshore species, salmon, sea cucumber, and CA halibut management. Indirect impact Increased position and effort data from 1,583 vessels: 349 vessels using longline gear are included (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear identified under Alt. 3; all vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 CA halibut vessels); 892 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) to take and retain, possess or land OA groundfish; vessels using net gear (approximately 3 CPS vessels); and 4 vessels using other OA gears. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish	Direct impact VMS would allow for greater flexibility in the use of management rules for slightly fewer vessels than those identified under Alt. 6A, because 58 salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. VMS will provide slightly less data than Alt. 6A and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, HMS, CA nearshore species, sea cucumber, CA halibut and salmon management (excluding salmon troll vessels fishing north of 40°10' N. lat.) Indirect impact VMS would decrease position and effort data for slightly fewer vessels than those identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. Fewer salmon vessels would be expected to discard groundfish to avoid VMS requirements.
Alternative 7 Vessel >12 ft with RCA restrictions	Direct impact VMS would allow for greater flexibility in the use of management rules for slightly less vessels than those identified under Alt. 6A. Approximately 22 vessels under 12 ft in length would be excluded. VMS will provide slightly less data than Alt. 6A and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, HMS, CA nearshore species, sea cucumber, CA halibut and salmon management (excluding salmon troll vessels fishing north of 40°10' N. lat.) Indirect impact Similar to those impacts identified under Alt.6A. because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are expected to fish in Federal waters.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact Includes data from 1,463 vessels: 349 vessels using longline gear 282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 CA halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For the incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Indirect impact Increased position and effort data from 1,463. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.
SOCIO-ECONOMIC ENVIRONMENT - Continued	

FISHERY MANAGEMENT	Changes to how the fisheries are managed as a result of the collection of VMS position data
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impact Includes data from 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 CA halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Indirect impact Increased position and effort data from 1,123. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact The use of RCA management would be discontinued and management measures such as trip limits and closed seasons would need be used to reduce the catch of overfished species. Keeping overfished catch within the OY may required extensive closures. Indirect impact Little data available to managers to assess OA fishing location and intensity.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.3.2 Fishery Management

Direct impacts on fishery management actions include changes in the availability of information that directly aids fishery managers in administering time/areas restrictions. These restrictions typically include: seasonal access restrictions to resources, closed area management, depth restrictions, trip duration restrictions, or limits on the number trips. Deterring misreporting of catch for areas other than where fish were caught is also a direct effect on management because accurate information is needed to maintain the integrity of data used for management decisions made during the fishing season.

When there is a high degree of error or potential non-compliance associated with time/area restrictions, meeting management objectives is more difficult. Therefore, managers must be more conservative in order to meet harvest objectives. Having greater flexibility in the use of management rules with time/area restrictions is advantageous because it allows managers to deal with harvest issues on a refined level, rather than having to be more conservative to buffer for greater error or potential non-compliance. If problems can be identified early, prompt action can be taken to minimize the impacts on the groundfish fleet or the stock. For example, if fishing effort by some or all sectors of the fishery shifts to areas where data indicates that higher bycatch are likely, preseason projections may be inaccurate. If managers can identify such shifts, they may be able to restrict access to areas of high bycatch to keep overall catch within the harvest specifications.

Some mis-reporting and transcription errors can be addressed using VMS. Misreporting of catch directly undermines efforts to manage fisheries properly and impedes progress toward the goal of sustainable fisheries. Deterring the misreporting of catch taken in areas other than where fish were caught helps to maintain the integrity of data used for management decisions.

When linked with a personal computer, laptop or data terminal, VMS systems with 2-way communications (currently 2-way systems are not required in the groundfish fishery) can provide commercial fishers with the opportunity to report catch information electronically to home offices and fisheries managers. Under VMS, detailed commercial catch data and details of specific areas fished (provided by GPS) could be recorded using on-board computers or a mobile terminal and transmitted directly to a central database. The central database could be programmed to analyze the aggregate data from all vessels as it is received, thereby enabling the performance of the fishery to be monitored in 'real time', allowing more effective and timely fisheries management strategies to be developed. Satellite technology has the potential to quickly transform fisheries management from being reactive, based on limited historical data, to a pro-active process involving decisions based on analysis of real time data about the fishery. Fisheries management strategies are underpinned by catch data supplied by fishers and processors. There is usually a substantial delay before fish tickets, the primary information source to assess fishing activities, is received, analyzed and available in a format suitable for use by fisheries managers.

Indirect impacts on fishery management include change in the availability of information used as a basis for making management recommendations and decisions that are more distant in time. VMS position data along with data from other sources may be combined and analyzed to better understand the effectiveness of management actions at achieving the intended results and to make recommendations for future measures.

Typically, fisheries management rules are designed to achieve sustainable and profitable fishing through a variety of methods. This usually includes some form of licensed vessel access to particular areas, restrictions on gear types, restrictions on fishing time, quotas on the amounts of particular species that may be caught, etc. Fishery management is most effective when catch in the fishery can be quantified and measured. This means measuring the quantity of fish being caught and identifying the place where the fish are caught. VMS does not provide information on the quantity of fish being caught nor does the system being proposed for the OA groundfish fishery require that the VMS system be used as a means of communicating catch information, though some VMS transceivers can be used as a communication tool. VMS does, however, clearly make it possible to improve the availability of data in relation to the location of fish catch.

Data gathered from commercial fisheries are needed to assess the effectiveness of management regulations. Logbooks, landing surveys, VMS, and observers are different fishery dependent methods used to collect data on harvest location. Interception at sea by an independent vessel can also be used to obtain harvest location data. The cost of collecting data directly from fishery participants tends to be lower than collecting the data from an independent source. This is because it is a byproduct of the fishing activity. Some forms of fishery dependent data, particularly unverified logbooks and landing surveys, are more subject to bias than other methods and their collection and use in measuring the effectiveness of management measures requires added care such as verification procedures. Alternatives 2 -7 provide for expanded VMS coverage that has the potential of producing reliable and useful position data for assessing the effectiveness of OA fishery management measures relating to time and area management. At a minimum, the data can be used to efficiently monitor fishing location and to verify times and dates for the OA fleet where logbook data is generally not available. It can also be used to provide information on days at sea and effort by area. When combined with observer data, broader interpretations of position data may be possible.

Understanding where fishing effort is occurring in real time may provide insight into understanding information reported on fish tickets and be useful in understanding how management measures affect fishing behavior. Knowing where a vessel is fishing, as compared to where the catch is being landed, may be valuable in assessing the effectiveness of trip limit management lines and differential trip limits. The data provided by VMS are cost effective and accurate over large geographical areas. Accurate and timely data on fishing locations are necessary to assess effectiveness of closed areas and the overall results of the management scheme.

VMS data can be combined with observer data to assess the effectiveness of management measures. However, the value in combining observer data with VMS data for non-enforcement purposes depends on the amount of observer data on catch and discards that is available from the different gears and fishing strategies. At this time, there is little data on the OA fisheries. In the long term, when observer data becomes available, VMS may provide information that results in a better understanding of fishery location and a spatial understanding of fish stocks.

As noted above, electronic logbooks have been developed that can be integrated with VMS transceivers with two-way communications. If electronic logbooks could be combined with a VMS system for all or a portion of the OA fisheries, there would be several indirect benefits to management and to the quality and availability of information on which management decisions are based. First, there is only a single data entry function and this can be performed very soon after each fishing operation is completed (at-sea or shoreside depending on the individual fishery). Paper logbooks must first be filled out by the fisher and then submitted to a government agency for data entry before logbook data can be used. In performing the data entry function, the fisher will interact directly with the editing checks for the data and a more complete and accurate data record can be required before the data record is accepted by the computer system. Having electronically recorded the data, the operator may produce a hard copy and also transmit the data to the fisheries agency or other recipients such as the fishing company, allowing that data to be easily incorporated into appropriate databases. As a result, improvements in timeliness, accuracy and reduced costs are possible. When the data is in the database and available to be analyzed, it can be used to improve the ability of managers to measure the effectiveness and economic impacts of management measures.

Comparison of the Alternatives

The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the alternatives. Each of the alternatives defines the portion of the OA fleet, that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Alternative 1 requires nongroundfish trawl vessels to provide declaration reports prior to leaving port on a

trip in which fishing occurs in an RCA. Under Alternative 1, the least amount of data would be available to support a flexible management regime or to deter misreporting of catch. However, this is the alternative that is most likely to result in incidentally caught groundfish being retained because the added cost for retaining incidentally caught groundfish is minimal and may be used to offset the cost of the fishing trip for the target species.

Alternative 2 maintains the declaration provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 322 vessels (282 directed groundfish, 38 Pacific halibut, and 2 CA halibut) vessels using longline gear to take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 would require the smallest proportion of the OA fleet (only vessels using longline gear) to have and use VMS and therefore provide the least amount of data that can be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. VMS may result in increased bycatch and lost landings data if incidental groundfish catch by Pacific halibut vessels is not retained. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements. Given the mobility of vessels within the fishery, directed longline vessels could choose to change gears to avoid the VMS requirements. VMS will provide accurate longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management. The added cost of VMS may result in vessels with the lowest exvessel revenue from groundfish choosing to not retain groundfish to avoid VMS requirements.

Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, and 6 prawn, 21 CA sheephead) using pot gear to take and retain, possess or land OA groundfish. Therefore, Alternative 3 would provide more data than Alternative 2; however, it would provide less data than Alternative 4A. The addition of the pot gears to the VMS program will allow for greater flexibility in the use of management rules for vessels using pot gear that take and retain, possess or land OA groundfish. VMS will provide accurate pot and longline fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, possibly Dungeness crab, prawn, and CA nearshore species management. Similar to Alternative 2, under Alternative 3, some vessels may change to line gear to avoid the VMS requirements. Table 3.3.3.9 groups vessels into weight categories (less than 100 lb per year, 101-500 lb per year, 500-1000 lb per year, and more than 1000 lbs per year) based on the annual weight of groundfish landed between 2000-2004. Table 3.3.3.9 shows that the majority of Dungeness crab vessels landing groundfish between 2000 and 2004 have landed less than 100 lb in an entire year. Therefore, it is likely that most if not all of the 21 vessels per year that land groundfish would discard the groundfish to avoid the VMS requirements. Between 2000 and 2004, Table 3.3.3.1 shows that Dungeness crab vessels landed about 0.3 mt of groundfish per year with an exvessel value of $1,104.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the vessels identified under Alternative 3. The primary difference between the 2 alternatives is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear that take and retain, possess or land groundfish. Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements. Alternative 4B adds those pink shrimp vessels that are not also registered to LE groundfish permits. VMS would allow for greater flexibility in the use of management rules for vessels using nongroundfish trawl gear. VMS will provide accurate pot, longline and nongroundfish trawl (except pink shrimp on 4A) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, and CA halibut management. This may be valuable for those monitoring fisheries that have area restrictions. Alternative 4B results in no change over Alternative 4A for pink shrimp vessels because fishing in the RCA is permitted for these vessels. Increased longline, pot and nongroundfish trawl position and effort data could be used along with declaration reports, observer data, survey information, and

fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 vessels groundfish, 58 CA halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish (excludes salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for the vessels identified under this alternative. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear (except salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, Dungeness crab, prawn, and CA nearshore species management, prawn, sea cucumber, HMS and CA halibut management Alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (10 HMS line and 2 longline, 21 Dungeness crab pot), it includes approximately 234 salmon troll vessels. Under this alternative, VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll) fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut, prawn, and CA nearshore species, prawn, sea cucumber, and CA halibut management. Alternatives 5A and 5B may also benefit salmon management which has area restrictions.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which an RCA restriction applies, includes the largest number of OA vessels. Approximately 1,583 vessels are included under Alternative 6A: 349 vessels using longline gear are included (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 193 vessels using pot gear identified under Alternative 3; all vessels using trawl gear (approximately 32 ridgeback prawn, 14 Sea cucumber, and 34 CA halibut vessels); 892 vessels using line gear as identified under Alt. 5B (includes salmon troll coastwide) that take and retain, possess or land OA groundfish; and 72 vessels using net gear (25 HMS and 47 CA halibut). VMS would allow for greater flexibility in the use of management rules for pot (except Dungeness crab), longline, nongroundfish trawl (except pink shrimp), and line gear (except HMS and salmon troll), and will thereby help to maintain the integrity of data used for groundfish management and possibly salmon management. VMS will provide accurate pot, longline, nongroundfish trawl (except pink shrimp), and line gear fishing location data and thereby help to maintain the integrity of data used for modeling and groundfish management decisions. Accurate fishing location data may be beneficial to Pacific halibut management, Dungeness crab, prawn, HMS, CA nearshore species, salmon, sea cucumber, and CA halibut management. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs. Alternative 6A would provide the most VMS data and would support the most flexible management regime.

Alternative 6B affects approximately 58 less vessels annually than does Alternative 6A, all of whom use salmon troll gear north of 40°10' N. lat. and retain only yelloweye rockfish. Alternative 7, is much the same as Alternative 6A except that data from approximately 22 vessels (6 longline, 2 pot, and 14 line gear vessels) would not be available because the vessels less than 12 feet in length would be excluded. However, most if not all vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not trigger the VMS requirement.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear,

and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For the incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Data could be used along with declaration reports, observer data, survey information, and fish ticket data to better refine estimates of total fishing mortality and improve the ability to manage the fishery inseason to stay within the harvest guidelines and OYs.

Because Alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land less than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alternative 8. Under Alternative 9, data from 1,123 vessels could allow for greater flexibility in the use of management rules for the vessels under this alternative. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). VMS would allow for greater flexibility in the use of management rules for vessels identified under this alternative. For the incidental OA vessels identified under this alternative, accurate VMS fishing location data may be beneficial to the nongroundfish target fisheries management. Only small amounts of data are likely to be available from the California halibut, and salmon troll fisheries.

Alternative 10, the no action alternative would have no VMS requirements, but the use of RCA management would be discontinued and management measures such as trip limits and closed seasons would be used to reduce the catch of overfished species. Little data would be available to managers to assess OA fishing location and intensity.

SOCIO-ECONOMIC ENVIRONMENT - COMPARISON OF THE ALTERNATIVES	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 1 Status quo	Direct impacts No change in fishery participation costs for harvesters. Because enforcement has less ability to target enforcement activities, vessels without VMS or declaration reports may be the subject of more investigations and boardings than vessels with VMS or those providing declaration reports. The RCAs may need to be simplified, or buffers around closed areas added so the integrity of closed areas can be maintained; fishers will likely encounter increased costs from fishing in areas where catch rates are lower. Indirect impacts Potential future groundfish catch levels may be reduced and stability in the fishery may be decreased if non-compliance with depth-based management measures results in higher than projected of overfished species catch.
Alternative 2 Vessels using longline gear	Direct impacts: Per vessel costs for a transceiver unit with installation are $1,200-$2,700 in Year 1, and $250-$625 in subsequent years. Annual operating cost to harvesters include: maintenance $60-$160 and transmission fees $192-$730. Fishers who land groundfish taken incidentally in non-groundfish fisheries and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish. An unknown portion of directed groundfish vessels using longline gear to take and retain, possess or land groundfish may choose to change gears to pot or line gear avoid VMS requirements. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $448,224 - $1,458,660 year 1, $61,824 - $235,060 in subsequent years. Greater flexibility in the use of management rules with geographical areas restrictions allows greater access to healthy stocks than would otherwise not be allowed. Indirect impacts: Potential for future increases in groundfish catch levels could offset short-term economic loss associated with VMS if increased stability in the fishery results because the integrity of RCAs is maintained. Benefits of fishery stability would likely be greatest for fishers with high degrees of dependency on groundfish. If less dependent vessels leave the fishery, groundfish landings limits for healthy stocks could potentially increase for the remaining fishers. Vessels that purchase VMS units with 2-way communications could choose to use email communications to market catch that would otherwise be discarded at sea. If this were to occur, it could lead to greater efficiencies in seafood marketing and reduced discards for approximately 282 directed groundfish, 38 Pacific halibut, and 2 CA halibut vessels using OA longline gear. If a large portion of the fishery chose to use 2-way communications to contact a broader range of buyers and coordinate deliveries or to negociate purchase prices, it could result in shift in the processing sector. Processors buying low volumes of groundfish from a large number of fishers who each land small amounts, such as occurs in the live-fish fisheries, may have difficulty obtaining groundfish if the number of fishers who choose to exit the fishery is substantial in a given port.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 3 Vessels using longline or pot gear	Direct impact: Per vessel costs are the same as Alt. 2. An unknown portion of directed groundfish vessels using pot gear may choose to change to line gear to avoid VMS requirements. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $716,880 - $2,332,950 year 1, $98,880 - $375,950 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 2 because both longline and pot vessels that take and retain, possess or land groundfish are included. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 2., because the likelihood of the integrity of the RCAs being maintained increases when both longline and pot vessels that take and retain, possess or land groundfish are included. Benefits of fishery stability would be greatest for directed fishers who have a high degree of dependency on groundfish. Potential benefits of marketing efficiencies and potential shift in processing sector as identified under Alt. 2, plus approximately 193 vessels using pot gear could choose to use VMS communications as marketing tool. The risk to low volume processors is slightly greater than Alt. 2
Alternative 4A Vessels using longline, pot or trawl gear (except pink shrimp)	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $824,064 - $2,681,760 year 1, $113,664 - $432,160 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 3 because longline, pot, and nongroundfish trawl (excluding pink shrimp) vessels that take and retain, possess or land groundfish are included. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 3., because likelihood of RCA integrity being maintained is increased when longline, pot, and nongroundfish trawl (excluding pink shrimp) vessels are included. Benefits of fishery stability would be greatest for directed fishers who have a high degree of dependency on groundfish. Potential benefits of marketing efficiencies and potential shift in processing sector is as identified under Alt. 2 and 3, plus approximately 77 vessels using nongroundfish trawl gear could choose to use VMS communications as marketing tool. The risk to low volume processors is slightly greater than Alt. 3

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 4B Vessels using longline, pot or trawl gear	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $899,232 - $2,926,380 year 1, $124,032 -$471,580 in subsequent years. Greater flexibility in the use of management rules with geographical areas - benefits are the same as Alt. 4A because longline, pot, and nongroundfish trawl vessels that take and retain, possess or land groundfish are included. Cost to pink shrimp fishers increases without increase in direct benefits. Indirect impact: Potential for future increases in groundfish catch levels same as Alt. 4A., because likelihood of RCA integrity being maintained is increased when longline, pot, and nongroundfish trawl vessels are included. Benefits of fishery stability would be greatest for directed fishers who have a high degree of dependency on groundfish. Pink shrimp trawl is neutral because they use finfish excluders and do not have RCA restrictions. Potential benefits of marketing efficiencies and potential shift in processing sector is as identified under Alt. 2 and 3, plus approximately 131 vessels using nongroundfish trawl gear could choose to use VMS communications as marketing tool. Risk to low volume processors is slightly greater than Alt. 4B
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll.	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,740,000 - $5,662,500 year 1, $240,000 - $912,500 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater benefit than Alt. 4A because longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessel (excluding salmon troll) that take and retain, possess or land groundfish are included. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 4A, because likelihood of RCA integrity being maintained is increased when longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessel (excluding salmon troll) that take and retain, possess or land groundfish are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits of marketing efficiencies and potential shift in processing sector as identified under Alt. 2, 3 and 4 except that approximately 590 groundfish, 58 CA halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish could also receive potential benefits of marketing efficiencies and stability in the groundfish fishery. Risk to low volume processors is slightly greater than Alt. 4

Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,022,576 - $6,582,090 year 1, $278,976 - $1,060,690 in subsequent years. Greater flexibility in the use of management rules with geographical areas - slightly greater than Alt. 5A because longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels that take and retain, possess or land groundfish are included. HMS and Dungeness crab vessels are not projected to have overfished species catch in 2005; therefore, excluding them would likely result in minimal if any changes to overfished species management flexibility. Indirect impact: Potential for future increases in groundfish catch levels slightly increased over Alt. 5A., because likelihood of RCA integrity being maintained is increased when longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels that take and retain, possess or land groundfish are included. Salmon troll vessels have a greater potential for taking constraining overfished species than do the Dungeness crab and HMS vessels that would be excluded under this alternative. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery as identified Alt. 2, 3, 4 and 5A, except Dungeness crab and HMS vessels, but for an additional 241 salmon troll vessels. Risk to low volume processors is slightly greater than Alt. 5A because salmon troll vessels are included
Alternative 6A Vessels with RCA restrictions	Direct impact: Per vessel costs are the same as Alt.2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,203,536 - $7,170,990 year 1, $303,936 - $1,155,590 in subsequent years. Greatest flexibility in the use of management rules with geographical areas because all longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessel that have RCA restrictions would be included. Unlike 5B, all nongroundfish trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Indirect impact: Potential for future increases in groundfish catch levels is greatest under this alternative, because likelihood of RCA integrity being maintained is increased when all vessels that have RCA restrictions are included. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery as identified under Alt. 2, 3, 4, & 5A and all Pacific halibut directed fishery vessels, vessels using salmon troll gear to take and retain, possess or land groundfish, and all vessels using nongroundfish trawl gear. Risk to low volume processors is similar to 5B

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish	Direct impact: Per vessel costs are the same as Alt. 2. Vessels that are likely to leave the fishery is the same as Alt. 6A except that the number of salmon trollers that are likely to leave the fishery is slightly less than under Alt. 6A because 58 vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would not be required to have VMS. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,122,800 - $ 6,908,250 in year 1, $292,800 - $1,113,250 in subsequent years. Greater flexibility in the use of management rules with geographical areas (slightly less than 6A) because all longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels (excluding salmon troll north of 40°10' N. lat. that only land yellowtail rockfish) that have RCA restrictions would be included. Unlike Alt.5B, all nongroundfish trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Indirect impact: Potential for future increases in groundfish catch levels is slightly less than to those identified under Alt. 6A; 58 salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. Potential benefits from marketing efficiencies as identified under Alt. 6A, because salmon troll vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded. The risk to low volume processors greatest, but similar to 5B
Alternative 7 Vessel >12 ft with RCA restrictions	Direct impact: Per vessel costs are the same as Alt. 2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,172,912 - $7,071,330 year 1, $299,712 - $1,139,530 in subsequent years. Greater flexibility in the use of management rules with geographical areas because all longline, pot, nongroundfish trawl (excluding pink shrimp), and line vessels >12 ft in length that have RCA restrictions would be included. Unlike Alt.5B, all nongroundfish trawl vessels would be included rather than only those that take and retain, possess or land groundfish. Basically, same as 6A because it is unlikely that many, if any, of the 22 vessels that are < 12 ft in length fish in Federal waters. Indirect impact: Potential for future increases in groundfish catch levels is similar to those identified under Alt.6A because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are likely to fish in Federal waters. Potential benefits from marketing efficiencies similar to those identified under Alt.6A because 22 vessels under 12 ft in length would be excluded. Few if any of these vessels are expected to fish in Federal waters. Risk to low volume processors is similar to 5B

SOCIO-ECONOMIC ENVIRONMENT - Continued	
HARVESTERS & PROCESSORS	Changes in fishery participation costs and groundfish revenue as a result of the requirement to carry and use VMS.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impacts No change in fishery participation costs for harvesters. Per vessel costs are the same as Alt. 2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is$2,036,496 -$6,627,390 year 1, $280,896 - $1,067,990 in subsequent years. Greater flexibility in the use of management rules with geographical areas for the 1,463 vessels included under this alternative: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Indirect impact: Potential for future increases in groundfish catch levels similar to Alt 6A. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery similar to those identified under Alt.6A for directed groundfish vessels.
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impacts No change in fishery participation costs for harvesters. Per vessel costs are the same as Alt. 2. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,563,216 - $5,087,190 year 1, $215,616 - $819,790 in subsequent years. Greater flexibility in the use of management rules with geographical areas for the 1,123 vessels included under this alternative 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). Indirect impact: Potential for future increases in groundfish catch levels similar to Alt 6B. Benefits of fishery stability would be greatest for fishers with high degree of dependency on groundfish. Potential benefits from marketing efficiencies and stability in the groundfish fishery similar to those identified under Alt.6A for directed groundfish vessels.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impacts No change in fishery participation costs for harvesters. If the use of RCAs are eliminated, closed season and reduced trip limits would like result in a drastic reductions in directed OA fishing opportunity. Indirect impacts Potential future groundfish catch levels may be reduced and stability in the fishery may be decreased if non-compliance with depth-based management measures results in higher than projected of overfished species catch.
Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.	

4.3.3 Harvesters and Processors

Direct Impacts**:** While the primary focus of VMS, from a resource management perspective, is with the collection of position data to monitor compliance with depth-based area management, there are very clear benefits to industry from VMS. The most evident direct benefit to industry resulting from the availability of VMS information is the flexibility in fishery management, such as the use of depth-based management.

To allow for a more liberal depth-based management regime, as has been in place since 2003, it was necessary for the Council and NMFS to take action to establish a monitoring program to ensure the integrity of these large irregularly-shaped depth-based conservation areas. With the 2003 Annual Specifications and Management Measures, the Council recommended along with depth-based management strategy, that NMFS include implementation of a VMS monitoring system to track movement of vessels through and within the RCAs. Without a depth-based management strategy, the fishery would be managed under the more seriously constrained limits on healthy stocks that co-occur with overfished species. Geographically defined areas would likely revert to those that were in place before September 2002. These areas tended to be nearshore or defined by a simple latitude lines.

A more liberal depth-based management regime is only possible if the integrity of the depth-based conservation areas can be ensured. Maintaining the integrity of the conservation areas largely depends upon the ability to enforce such management measures. Without the ability to ensure the integrity of the conservation areas, it is most likely that the depth-based management strategy will be discontinued. If this were the case, the management structure for those fisheries without VMS could well revert back to more restrictive limits or no limits on healthy stocks in order to protect overfished species.

When linked with a personal computer, lap top or data terminal, VMS systems with 2-way communications (currently 2-way systems are not required in groundfish fishery). Two-way systems can provide commercial fishers with the opportunity obtain information from processors or home offices and to report catch information electronically to home offices and fisheries managers. Under VMS, detailed commercial catch data and details of specific areas fished (provided by GPS) could be recorded using on-board computers or mobile terminals and transmitted directly to a central database. The central database could be programmed to analyze the aggregate data from all vessels as it is received, thereby enabling the performance of the fishery to be monitored in 'real time', allowing more effective and timely fisheries management strategies to be developed. This provides potential cost savings for fishermen, particularly if fishery management transforms from being reactive to being a proactive process involving decisions based on analysis of real time data about the fishery. Fisheries management strategies are underpinned by catch data supplied by commercial and recreational fishers. There is usually a substantial delay before this information is received, analyzed and available in a format suitable for use by fisheries managers and industry. Some mis-reporting and transcription errors can be addressed using VMS.

Cost burden: The cost burden of VMS includes the costs for installation, VMS transceiver unit, annual maintenance, replacement cost, cost to transmit hourly positions and declaration reports. Table 4.3.4.1 shows the estimated cost burden per vessel for VMS.

Table 4.3.3.1. Estimated burden, per vessel, for the VMS monitoring systems

	Alternative 1&10 Status quo	Alternatives 2-9 Cost per vessel for VMS and declaration reports
Installation - start up cost	$0	Minimal - not to exceed 4 hours or $200 Most are do-it yourself installation, manufacturer install approximately $200 do-it-yourself $120 5 min to complete installation report, $3 to send fax to NMFS
VMS transceiver/transponder unit - start up cost	$0	$1,000 - $2,500 ($3,800 if computer is added for 2-way communications including email)
Annual maintenance * Self * Professional	$0	2 hours or $60 per year 2 hours or $160 per year
Annual replacement costs (unit cost/years of service)	$0	$250-$625 per year (estimate based on 4 years of service)
Annual cost to transmit 24 hourly position reports	$0	$192-$730 ($15.99/mo-$2/day)
Annual cost to transmit exemption reports (4 min/rpt 2 per year)	$0	$0 (toll free call)
Annual cost to transmit declaration report (4 min/rpt- 12 time per year)	$0	$0 (toll free call)

Installation - The time burden for installation of the units is estimated at 4 hours per vessel, or $120. Personnel costs are estimated to be $30 per hour (Table 4.3.3.1.). The actual installation time for a VMS unit is estimated to be less than two hours, but a higher estimate of 4 hours/vessel is based on a worst case scenario where the power source (such as a 12 volt DC outlet) is not convenient to a location where the VMS unit can be installed. Most of the systems are do-it-yourself installations.

The installation of the Inmarsat-C Thrane units are do-it-yourself. The installation of software and attachment of a personal computer or lap top to an Inmarsat-C unit may also require dealer assistance. Satamatics and Orbcomm units can be self installed. However, vendor experience indicates that professional installations provide the best results for optimal unit performance.

Installation/Activation Report - Given that the VMS hardware and satellite communications services are provided by third parties as approved by NMFS, there is a need for NMFS to collect information on the individual vessel's installation in order to ensure that automated position reports will be received. This information collection would not increase the time burden for installation of VMS, but does require that a certification and checklist be returned to NMFS prior to using the VMS transceiver to meet regulatory requirements.

The checklist indicates the procedures to be followed by the installers. The VMS installer completes the NMFS issued checklist and signs the certification before returning it to NMFS. Signing the completed checklist shows that the installation was done according to the instructions and provides the Office of Law Enforcement with information about the hardware installed and the communication service provider that will be used by the vessel operator. Specific information that links a permitted vessel with a certain transmitting unit and communications service is necessary to ensure that automatic position reports will be received properly by NMFS. In the event that there are problems, NMFS will have ready access to a database that links owner information with installation information. NMFS can then apply troubleshooting techniques to contact the vessel operator and discern whether the problem is associated with the transmitting hardware or the service provider.

The time and cost burden of preparing and submitting installation information to NMFS is minor. Submission of a checklist would be required only for the initial installation or when the hardware or communications service provider changes. NMFS estimates a time burden of 5 minutes ($2.50 at $30 per hour) for completing the checklist and additional $3 for mailing/faxing to NMFS, for a total of $5.50 per occurrence (Table 4.3.3.1).

The ability for NMFS to ensure proper operation of the VMS unit prior to the vessel's departure will save time and money. The installation checklist and activation report are available over the internet website. These reports would be faxed or mailed to NMFS.

VMS transceiver unit On September 23, 1993, NMFS published proposed VMS standards at 58 FR 49285. On March 31, 1994, NMFS published final VMS standards at 59 FR 15180. These notices stated that NMFS endorses the use of VMS and defined specifications and criteria for VMS use. On September 8, 1998, NOAA published a request for information (RFI) in the Commerce Business Daily in which it stated the minimum VMS specifications necessary for NOAA's approval. The information was used as the basis for approving the mobile transceiver units and communications service providers for the Pacific coast groundfish fishery.

Units currently type approved for the Pacific Coast Groundfish Fishery are shown in (Table 4.3.3.2.) And include: Thrane and Thrane TT 3022D and 3026, Satamatics SAT101, and Stellar ST2500G. NMFS Type approved units are tested and approved by NMFS OLE. A list of VMS mobile transponder units and communications service providers approved by NOAA for the Pacific Coast groundfish fishery were published in the Federal Register on November 17, 2003 (68 FR 64860). Each time the list is revised, it will be published in the Federal Register. The cost of the transceivers currently type approved for the Pacific Coast groundfish fishery are shown in Table 4.3.3.2.

The North American Collection and Location by Satellite, Inc. (NACLS) is the sole service provider of the ArgoNet systems. The Argos Mar-GE and MAR-YX mobile transponder units costs $2,000. The ArgoNet MAR GE uses NOAA polar-orbiting satellites, and, as such, it is considered a NOAA Data Collection and Location System. The use of any NOAA Data Collection and Location System is governed by 15 CFR part 911. Under these regulations, the use of a NOAA Data Collection and Location System can be authorized only if it is determined that there are no commercial services available that are adequate. In addition, special provisions have been made because of cost effectiveness to the Government, resulting in a temporary approval (3 year approval was granted for the Atlantic pelagic longline fishery).

On June 10, 2002, 50 CFR 679.7(a)(18) required all vessels fishing in the Bering sea and Gulf of Alaska using pot, hook-and-line or trawl gear that are permitted to directly fish for Pacific cod, Atka mackerel or pollock to have an operable VMS transceiver. Vessels that also participate in the WOC fisheries (primarily LE vessels) qualified for reimbursements to the Argos MAR-GE as a result of their participation in the Alaska groundfish fishery. Allowing the use of Argos MAR-GE by WOC operating vessels that have purchased these units for participation in the Alaska groundfish fisheries would eliminate the cost of purchasing, installing and maintaining a second unit for these vessels. As of April 15, 2004(69 FR 19985,) new provisions for the Alaska fisheries prohibit the installation of new Argos units. Replacement units will need to be compatible with the requirements of both fisheries or vessels will need to purchase separate units. Similarly, allowing vessels to use units they have already purchased for other business purposes, providing they are a type-approved model with the required software and hardware, would also eliminate the cost of

purchasing, installing and maintaining a second unit for these vessels. The number of OA vessels that currently have VMS transceivers is unknown.

Most of the VMS transceiver units can be operated for extended periods from the same DC power source used to run other on board electronic equipment and so should increase power consumption only marginally.

Maintenance of transponder unit Once a vessel is used for fishing in the OA fishery in Federal waters, the vessel operator is required to operate the VMS unit continuously for the remainder of the year. This means that the vessel operator will need to maintain the transponder unit, antennas, and the electrical sources that power the system themselves or have it serviced by a professionally.

When an operator is aware that transmission of automatic position reports has been interrupted, or when notified by NMFS that automatic position reports are not being received, they must contact NMFS and follow the instructions provided. Such instructions may include, but are not limited to, manually communicating to a location designated by NMFS the vessel's position or returning to port until the VMS is operable. There is a reporting burden associated with this requirement, but it is not expected to be substantial. The annual burden of these communications and the time required to maintain the antennas and electrical systems on the vessel operator is estimated to be approximately 2 hours per year or $60 if done by the vessels personnel, or $160 if professionally serviced (Table 4.3.3.1). In addition, some systems may require software to be updated. Many of the transponders can have their set of features upgraded by being reloaded/flashed with updated versions.

If a unit needs to be repaired, there may be fishing opportunity lost unless the unit can be quickly replaced.

Replacement cost (purchase price/years of service) The various VMS transceivers have similar life spans of about 4- 5 years before the units need to be replaced. Because of advancements in VMS systems or service providers that may no longer provide services, some models may become obsolete in less than 5 years. The purchase of these units may be considered as a tax deductible business expense during the first year of use. For depreciation purposes, VMS devices using satellite technology may qualify as “five-year property”, although devices using cell phone technology probably will be treated similar to other cell phone equipment, as “seven-year property.” For the purposes of this analysis, 4 years was used to estimate unit replacement costs. Table 4.3.3.1. shows the range of replacement costs.

Cost to transmit hourly positions The primary costs after purchase and installation of a VMS is the charge for the messages that communicate the vessel's position. Once installed and activated, position reports are transmitted automatically to NMFS via satellite. Once a vessel is used for fishing in the OA fishery in Federal waters, the vessel operator is required to operate the VMS unit continuously for the remainder of the year. The total costs for these messages depend on the system chosen for operation and the number of fishing days for units with a sleep function. Many of the systems have a sleep function. Position transmissions are automatically reduced when the vessel is in port. This allows for port stays without significant power drain or power shutdown. When the unit restarts, normal position transmissions automatically resume before the vessel goes to sea.

The estimated time per response varies with type of equipment and requirement. Upon installation, vessel monitoring or transponder systems automatically transmit data, which takes about 5 seconds, except when issued a VMS exemption or when the vessel is inactive in port and the VMS goes into sleep mode. Transmission costs vary between units, with some having daily rates or monthly rates. The daily rate for the Inmarsat D+, Inmarsat C, and Orbcom units is $2, while providers have begun providing packages as low as $15.99/mo for fishers who spend much of the month tied to the dock, resulting in reduced position reports (Table 4.3.3.1).

Table 4.3.3.2. VMS Equipment Currently in Type-approved for use in the Pacific Coast Groundfish Fisheries

Communication Service	Orbcomm	Inmarsat D+	Argos a/	Inmarsat-C
Transceiver/transponder name	**SST2500G-NMFS**	**Satamatics SAT101**	**MAR GE**	**Thrane and Thrane TT3022D, TT3026D**
Number of boats using				
Geographic coverage, when in line of sight of satellite or cell	Global	Global	Global	Global to 78°N/S
Communication between ship – shore	Two-way	Two-way	One-way, (ship-to-shore)	Two-way
Satellite type	Low earth orbit, Orbcomm Network	Geo-stationary, INMARSAT	Polar-orbiting, 5 NOAA meteorological	Geo-Stationary, INMARSAT
Time between the vessel position fix and receipt at NMFS	Within 5-10 minutes	Within 5-10 minutes	Varies per latitude, Alaska – 10-30min. avg. wait. HMS – 60-90min. wait	Within 5-10 minutes
Ability to poll/query the transceiver	Yes	Yes	No	Yes
Interval between position reports	Configurabel	Configurabel	30 - 60 minutes depending upon latitudes	Configurable for 5 minutes to 24 hours
Ability to change the interval between position reports	Remote from OLE	Remote from OLE	Factory reprogramming	Remotely from OLE
Position calculation (accuracy)	Integrated GPS (20 m)	Integrated GPS (20 m)	Integrated GPS (20m), reverts to Doppler when GPS blocked (350 or 1000m)	Integrated GPS (20m)
Automatic anti-tampering and unit status messages	Yes	Yes	Yes	Yes
Distress signal	Yes	Yes	Yes	Yes
Reduces power when stationary	Yes	Yes	Yes	Yes
Installation	Do-it-yourself	Do-it-yourself	Do-it-yourself	Dealer or electrician (costs not included), or do-it-yourself
Internal battery back-up	Yes	Yes	Yes, 48-hour	No
Log or memory buffer storing positions / number of positions	Yes	Yes	Yes, must download manually/?	Yes, auto, remote or manual download/ Trimble – 5000 Thrane – 100
Can send logbook/catch report data	Yes	Yes, limited	Yes, with computer	Yes, with computer
Transceiver/transponder cost	$1,200	$1,200	$2000 ($400 keypad optional)	Thrane TT3022D $2,500, TT3026M $1,550; additional $1,300 if optional computer for email is included
Daily communications cost for hourly positions	$2	$2	$5	$2

a/ The Argos MAR GE is only allowed for vessels that have been required to have this model for other fisheries such as the Alaska groundfish fishery

Exemption reports Exemption Reports would be sent by the vessel owner or operator whenever their vessel qualified for being excused from the requirement to operate the mobile transceiver unit continuously 24 hours a day throughout the calendar year (e.g. when the vessel will be operating outside of the EEZ for more than 7 consecutive days or the vessel will be continuously out of the water for more than 7 consecutive days). A vessel may be exempted from the requirement to operate the mobile transceiver unit continuously 24 hours a day throughout the calendar year if a valid exemption report is received by NMFS OLE and the vessel is in compliance with all conditions and requirements of the exemption. An exemption report would be valid until a second report was sent canceling the exemption.

Improved technology would be used to reduce the reporting burden on NMFS and the fishery participants. Vessels will call in exemption reports to a toll free number. With this system, vessels can call quickly and easily submit their report 24 hours a day.

Aside from the cost in time to summarize and call in a report, there will be no additional cost burden for respondents. All respondents are assumed to have access to a telephone. The telephone call will be placed through a toll-free number, so the respondent will not pay for the call. Two exemption reports are estimated to be submitted per vessel annually. Each report would require approximately 4 minutes to submit, for an average cost of $4 per vessel per year (at $30 per hour).

Declaration reports
Declaration reports are used to assist enforcement in identifying vessels that are legally fishing in conservation areas. Each declaration report is valid until cancelled or revised by the vessel operator. After a declaration report has been sent, the vessel cannot engage in any activity with gear that is inconsistent with that which can be used in the conservation area unless another declaration report is sent to cancel or change the previous declaration. Declaration reports are sent to NMFS and vessel operators receive confirmation that could be used to verify that the reporting requirement was met. It is necessary for a vessel owner, operator or representative to submit these reports because only they can make statements about where they intend to fish.

Vessels will call in declaration reports by dialing a toll-free, so the respondent will not pay for the call. The system allows vessels to quickly and easily submit their report 24 hours a day. Aside from the cost in time to summarize and call in a report, there will be no additional cost burden for respondents. All respondents are assumed to have access to a telephone.

Table 4.3.3.3 Range of VMS of projected costs to the fleet, by fishery and gear

Open access gear group	Average annual no. of vessels landing groundfish, 2000-2003	Cost to the fleet for VMS			Exvessel revenue from **all catch** for the by fishery for 2004	Exvessel revenue from **groundfish** for the by fishery for 2004
		Year 1, range of cost for purchase and installation of VMS units, - Per vessel cost - $1,200 -$2,500 ($3,800 with PC)	Subsequent years, range of costs for maintenance and replacement of VMS units Per vessel cost $80 - $785	Range of annual Transmission cost Per vessel cost $192 - $730		
Longline - groundfish directed	282	$338,400 - $761,400 ($1,071,600)	$87,420 - $221,652	$54,144 - $205,860	$1,429,412	$1,411,191
Longline - Pacific Halibut directed	65	$78,000 -$175,500 ($247,000)	$20,150 - $51,090 9	$12,480 -$47,450	$403,834	$28,920
Longline - CA Halibut	2	$2,400 -$5,400 ($7,600)	$620 - $1,572	$384 -$1,460	$3,749	--
Pot - groundfish directed	145	$174,000 - $391,500 ($551,000)	$44,950 - $113,970	$27,840 - $105,850	$990,939	$987,646
Pot - Dungeness crab	21	$25,200 - $56,700 ($79,800)	$6,510 - $16,506	$4,032 -$15,330	$70,436,411	$652
Pot - prawn/shrimp	6	$7,200 - $16,200 ($22,800)	$1,860 - $4,716	$1,152 -$4,380	$2,235,976	--
Pot - sheephead	21	$25,200 - $56,700 ($79,800)	$6,510 - $16,506	$4,032 -$15,330	$275,382	$7,088
Trawl - CA Halibut g/	40	$48,000 -$108,000 ($152,000)	$12,400 - $31,440	$7,680 -$29,200	$497,880	$35,637
Trawl - Sea Cucumber	14	$16,800 - $37,800 ($53,200)	$4,340 - $11,004	$2,688 -$10,220	$146,433	--
Trawl - Ridgeback Prawn	23	$27,600 - $62,100 ($87,400)	$7,130 - $18,078	$4,416 -$16,790	$140,523	$564
Trawl - Pink Shrimp	54	$64,800 - $145,800 ($205,200)	$16,740 - $42,444	$10,368 -$39,420	$5,776,643	$74
Line gear - groundfish directed	590	$708,000 - $1,53,000 ($2,242,000)	$182,900 - $463,740	$113,280 - $430,700	$2,512,737	$2,503,500
Line gear - CA halibut directed	58	$69,600 - $156,600 ($220,400)	$17,980 - $45,588	$11,136 -$42,340	$636,210	$5,674
Line gear - HMS	10	$12,000 - $27,000 ($38,000)	$3,100 - $7,860	$1,920 -$7,300	$1,492,405	$236
Line gear - Salmon troll (coastwide)	234	$280,800 - $631,800 ($889,200)	$72,540 - $183,924	$44,928 - $170,820	$25,824,244	$19,816
Line gear - Salmon troll (north only- no yellowtail)	176	$211,200 - $475,200 ($668,800)	$54,560 - $138,336	$33,792 - $128,480	$4,360,094	$13,046
Net gear - HMS	25	$30,000 - $67,500 ($95,000)	$7,750 - $19,650	$4,800 -$18,250	$1,383,716	$2,577
Net gear - CA halibut	47	$56,400 - $126,900 ($178,600)	$14,570 - $36,942	$9,024 - $34,310	XXX	$7,450

Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.

Description of analysis regarding vessels not retaining groundfish if VMS is required A simple analysis of economic costs and benefits was conducted to determine a plausible number of vessels that would retain groundfish if doing so meant that those vessels would be required to carry a VMS. Vessel level revenues were compared against the cost of purchasing, installing, maintaining, and operating a VMS system over a 20 year period. The cost of purchasing a unit was amortized over 20 years using an interest rate of 6 percent. Assumed in this analysis is that the decision to fish or not to fish was independent of groundfish retention for those fisheries where groundfish is not the target. This assumes that groundfish gross revenues are merely viewed as a bonus by fishers not targeting groundfish. Based on this assumption, total groundfish gross revenues were compared to annual VMS costs to determine whether vessels would elect to carry a VMS system. For vessels directing their efforts at groundfish, the analysis differed in that a range of vessels remaining in the fishery is presented based on a likely range of profit margins that correspond to gross revenues. This is done because groundfish is the target for those vessels, and the decision to fish is most likely based on the net revenue generated by the target if incidental catch is not part of expected future revenues. The lower bound of this range is 7.5 percent of gross revenues and the upper bound is 30 percent of gross revenues. Based on conversations with fishers and experience with the fishing industry, this range is expected to encompass the actual profit margin of the fishery, though additional input is necessary to further refine this range. Table 4.3.3.5 presents this simple analysis of economic costs and benefits.

Table 4.3.3.5 Approximate Number of Vessels Landing Groundfish if a VMS System is Required

Fishery	2000	2001	2002	2003	2004	Average
HMS - Hook and Line	0	0	0	0	0	0
CPS - Net	0	0	0	0	0	0
Salmon - Troll	1	4	3	0	2	2
California Sheephead - Pot	5	9	7	2	8	6
Pacific Halibut - Longline	9	5	6	14	20	11
California Halibut - Trawl	10	10	9	1	6	7
California Halibut - Hook and Line and Longline	1	3	0	3	4	2
Pink Shrimp - Trawl	45	38	28	1	1	23
Ridgeback Prawn - Trawl	6	5	3	2	1	3
Shrimp - Pot	2	4	4	2	1	3
Dungeness Crab - Pot	0	0	1	1	1	1
Groundfish Directed - Pot	52 - 83	49 - 82	50 - 80	56 - 96	48 - 70	51 - 82
Groundfish Directed - Longline	78 - 165	71 - 158	64 - 146	80 - 177	60 - 126	71 - 154
Groundfish Directed - Hook and Line (non-longline)	85 - 272	107 - 254	97 - 252	77 - 223	106 - 239	94 - 248

The OA groundfish fishery consists of vessels that do not necessarily depend on revenue from the fishery as a major source of income and predominately fish for other species where they inadvertently catch and land groundfish. Fishers who land groundfish taken incidentally in non-groundfish fisheries operating in areas outside the RCAs, and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish.

Table 4.3.3.6. shows the number of OA vessels by gross income levels of dependency for all West Coast landings. Between November 2000 and October 2001, 1,287 vessels landed groundfish in the OA sector of the groundfish fishery. Of these, 58% of the vessels (200) with a greater than 95% dependency on groundfish had less than $5,000 of gross income from West Coast landings. These vessels would be the vessels most affected by VMS requirements. A greater proportion of vessels with lower levels of dependency on groundfish fell within income categories greater than $5,000. However, this table does not represent landings for years when the RCA requirements or state nearshore LE programs were in place. Increases in higher valued groundfish catch in 2003, primarily sablefish, which may reduce the proportion of OA vessels in the lowest (<$5,000) income category, are not included in this table. Table 4.3.3.7 shows the annual fishing revenue for vessels landing groundfish in various OA target fisheries and with the different gears.

Table 3.3.3.6 Number of open access vessels by gross income levels of dependency for all West Coast landings (based on data from November 2000 - October 2001) a/

	Exvessel revenue from West Coast landings				
	<5,000	$5,000-$50,000	$50,000-$200,000	>$200,000	Total
<5%	45	268	169	34	516
>5% &<35%	52	101	44	0	197
>35% &<65%	47	50	8	0	105
>65% &<95%	63	55	6	0	124
>95% &<100%	200	138	7	0	345
Total	407	612	234	34	1,287

Extracted from table 6-17a DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery
a/ open access vessels with more than half of their total landings value coming from groundfish are considered to be in the directed fishery

Table 4.3.3.6. Number of incidental open access vessels groundfish by exvessel group, 2000 - 2003 (based on 8/24/04 PacFin data)

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
Longline -Groundfish Directed					
2000	76	27	25	11	164
2001	94	32	27	13	158
2002	59	30	17	12	145
2003	40	34	27	21	174
2004	40	27	19	13	123
Longline - Pacific Halibut					
2000	28	9	2	--	--
2001	28	3	2	1	1
2002	36	5	1	--	11
2003	23	6	2	2	5
2004	11	9	8	2	4
Longline - CA Halibut					
2000	5	--	–	--	–
2001	1	--	–	--	–
2002	2	--	–	--	–
2003	2	--	–	--	–
2004	2	–	–	–	–
Pot - Groundfish Directed					
2000	62	15	6	7	64
2001	48	14	16	1	61
2002	43	16	10	8	58
2003	31	12	14	7	70
2004	24	6	5	9	54
Pot - Dungeness crab					
2000	32	1	--	--	--
2001	24	1	--	--	--
2002	22	1	--	--	--
2003	16	1	--	--	--
2004	5	1	--	--	–

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
Pot - prawn/shrimp					
2000	7	--	2	–	–
2001	2	2	1	1	1
2002	-	3	--	1	--
2003	4	--	1	1	--
2004	2	–	–	–	1
Pot - sheephead					
2000	16	3	--	--	2
2001	17	2	2	1	4
2002	21	5	--	1	1
2003	12	--	--	--	2
2004	8	4	3	--	1
Trawl - sea cucumber					
2000	--	--	--	--	--
2001	2	--	--	--	--
2002	2	--	--	--	--
2003	1	--	--	--	--
2004	1	--	--	--	--
Trawl - CA halibut					
2000	11	6	1	2	2
2001	22	5	3	1	2
2002	19	5	--	4	1
2003	16	--	--	--	1
2004	6	1	1	1	4
Trawl -Ridgeback Prawn					
2000	14	3	1	3	1
2001	10	2	3	--	1
2002	9	--	2	1	--
2003	10	--	2	--	--
2004	4	--	--	1	--
Trawl -Pink Shrimp					
2000	15	6	2	1	38
2001	11	8	1	6	25
2002	15	9	4	7	9
2003	5	1	--	--	--
2004	3	--	1	--	--
Line gear -Groundfish Directed					
2000	316	50	94	35	265
2001	236	52	66	31	250
2002	187	46	69	27	247
2003	154	36	68	26	217
2004	144	31	49	14	238
Line gear - CA halibut					
2000	68	1	--	--	--
2001	66	3	--	--	--
2002	58	--	--	--	--
2003	43	3	--	--	1
2004	40	4	--	1	--
Line gear - HMS					
2000	18	--	--	--	--
2001	12	--	--	--	--
2002	7	--	--	--	--
2003	3	2	--	--	--
2004	5	1	1	--	--
Line gear - Salmon troll (coastwide)					
2000	276	4	1	--	--
2001	238	5	--	--	--
2002	201	6	--	--	--
2003	197	2	1	1	1
2004	233	4	--	--	--

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
Line gear - Salmon troll (north only)					
2000	209	3	--	--	--
2001	228	--	--	--	--
2002	143	5	--	--	--
2003	133	1	--	--	--
2004	155	2	--	--	--
Net gear - HMS					
2000	33	--	--	--	–
2001	26	1	--	--	–
2002	25	1	--	--	--
2003	20	--	–	–	–
2004	17	1	–	–	–
Net gear - CA Halibut					
2000	45	13	--	--	--
2001	38	9	--	--	--
2002	32	3	--	--	--
2003	33	4	--	–	–
2004	32	2	--	–	–

Each of the alternatives identifies and estimated number of vessels that are likely to be affected by the VMS requirement. These values are based on the average level of participation from 2000 to 2004, except for pink shrimp trawl which was based on 2003-2004. It is important to point out that these values may not be the actual number of vessels that would continue to use a particular gear type if VMS requirements were adopted.

Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts on harvesters and processors include, long-term changes in fishing opportunity, catch availability, and catch value that could result from the VMS requirement and collection of position data.

Short-term economic losses should be offset by future increases in catch levels if increased stability in the fishery results because the integrity of RCAs is maintained. The ability to know the precise location of vessels provides for speedy identification of suspicious or illegal fishing activity in relation to closed areas. Rather than spending significant resources on routine surveillance, enforcement resources can be directed to vessels operating in an unusual manner in the RCAs. Improved enforcement is in the interest of all fishers. Fishers and processors will be the ultimate beneficiaries when the fisheries regulations, developed for conservation and management are properly implemented and enforced. Maintaining the integrity of closed areas that are designed to protect overfished stocks, will aid in the recovery of the stocks and help to guaranteed the future of the industry.

With VMS, the law-abiding skipper can be satisfied that there will be less likelihood of the enforcement officers inspecting vessels that comply with the closed area regulations and a greater probability that inspection will focus on vessels that are suspected of violating the regulations. At times, the commercial fishing industry is subjected to criticism from members of the public and from other stakeholder groups regarding its responsibility to the environment in terms of complying with closure regulations intended to protect vulnerable species. While there may be some irresponsible operators, it is generally believed that the majority of commercial operators abide by closed area restrictions. VMS offers the commercial industry a mechanism to demonstrate its compliance with such regulations and hence honor its responsibility to the long-term sustainability of fisheries resources.

Electronic marketing is growing in importance in many industries, and could be developed for the fishing industry. If a sufficient number of vessels participating in the West Coast fisheries have 2-way communications through VMS and a computer, opportunities to market seafood through e-commerce services (electronic marketing systems) could become more readily available to the West Coast fishing industry. The ability to access the internet via Inmarsat makes likely that electronic marketing of seafood will become established as individual companies set up their own systems.

Electronic marketing systems could become a component used to match the supply of fish from a number of scattered producers with the demand from a variety of markets. An advantage of an electronic marketing systems is that the trading function is separate from the physical transfer of catch between sellers and buyers, which could allow prices to be formed centrally without the costly process of assembling buyers and sellers at a single location. As fishermen are made more aware of electronic market potential, they may choose to alter fishing practices to avoid gluts, avoid catching lower value species, or retain incidentally caught species because they find a buyer while still at sea. The overall result could be a more competitive market and improvement in the use of mixed catches, including the sale of fish that would otherwise have been discarded at sea. While electronic marketing of seafood has been technically possible for some years, extensive and high quality ship-to-shore communications were required to enable fishermen to communicate catch information to a shore-based computer linked into the system. Recent advancements in satellite technology, such as those made by Inmarsat makes it possible to bypass this impediment, allowing electronic marketing in the fishing industry much more feasible for small businesses, such as those found in the West Coast.

Comparison of the Alternatives

The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the primary difference between the alternatives. Each of the alternatives defines the portion of the OA fleet, that would be required to carry and use VMS transceivers and provide gear declaration reports. Alternative 10 is the only alternative that goes beyond VMS coverage by discontinuing the non-trawl and trawl RCA requirements for the OA fisheries.

Alternative 1, is the least expensive alternative in the short-term since it only requires nongroundfish trawl vessels to provide declaration reports prior to leaving port on a trip in which fishing occurs in an RCA. The greatest difficulty in maintaining the integrity of closed areas to ensure recovery of the overfished stocks occurs under status quo. In the long- term, if unmonitored incursions into the RCA affect the recovery of overfished stocks, fishing opportunity may be further reduced.

Alternatives 2-9 contain VMS requirements, for different groups of vessels within the OA fleet**.** The per vessel costs for a transceiver unit with installation is the same under all of the alternative: $1,200-$2,700 in Year 1, and $250-$625 in subsequent years. Annual operating cost to harvesters include: maintenance, $60-$160, and transmission fees, $192-$730. The added cost of VMS is likely to result in some fishers not retaining groundfish so as to avoid the VMS requirements. Table 3.3.3.9 shows the number of vessels by gear group that landed less than 500 lb of groundfish per year between 2000 and 2004. Some fishers may speculate that others will leave the fishery and trip limits will increase, others will pay for VMS and continue to retain groundfish. Fishers who land groundfish taken incidentally in non-groundfish fisheries and fishers who are less dependent on groundfish may choose to exit the fishery by not retaining groundfish or by not targeting groundfish during short periods between other fishing activities**.** Table 4.3.3.5 shows the number of vessels by assumed profit margins for OA incidental fisheries vessels by gears, 2000-2004**.**

Alternative 2 maintains the provisions of status quo, but adds the VMS and declaration reporting requirements for approximately 282 directed groundfish, 38 Pacific halibut, and 2 California halibut vessels using longline gear that take and retain, possess or land groundfish. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only 320 vessels using longline gear) to have and use VMS. The total cost of Alternative 2 to industry ranges between $448,224 - $1,458,660 year 1, $61,824 - $235,060 in subsequent years. An unknown portion of directed groundfish vessels using longline gear to take and retain, possess or land groundfish may choose to change gears to pot or line gear avoid VMS requirements.

Alternative 3 includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels using pot gear. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $716,880 - $2,332,950 year 1, $98,880 - $375,950 in subsequent years. An unknown portion of directed groundfish vessels using pot gear may choose to change to line gear to avoid VMS requirements.

Alternative 4A includes the same vessels as Alternative 3, but adds the VMS and declaration reporting requirement for approximately 23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels using nongroundfish trawl gear (excludes pink shrimp vessels) for a total of 592 vessels. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery $824,064 - $2,681,760 year 1, $113,664 - $432,160 subsequent years. Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4A plus 54 pink shrimp vessels for a total of 646 vessels. Estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $899,232 - $2,926,380 year 1, $124,032 -$471,580 in subsequent years.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 directed groundfish, 58 California halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels). The total number of vessels under 5A is 1,250. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,740,000 - $5,662,500 year 1, $240,000 - $912,500 in subsequent years. Alternative 5B, includes slightly more vessels than 5A because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (10

HMS line and 2 longline, 21 Dungeness crab pot), it includes approximately 234 salmon troll vessels. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,022,576 - $6,582,090 year 1, $278,976 - $1,060,690 in subsequent years.

Alternative 6A, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of OA vessels, 1,583 vessels. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,203,536 - $7,170,990 year 1, $303,936 - $1,155,590 in subsequent years. Unlike 5B, 6A also includes all the salmon troll vessels that take and retain, posses or land groundfish. Therefore, Alternative 6A would provide coverage for the largest number of vessels, which supports the greatest flexibility in the use of management rules with geographical areas.

Alternative 6B, affects approximately 58 fewer vessels annually than does Alternative 6A, all of which use salmon troll gear. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,122,800 - $6,908,250 in year 1, $2,92,800 - $1,113,250 in subsequent years. Under 6B, the vessels that are likely to leave the fishery is the similar to Alt. 6A, except that the number of salmon trollers that are likely to leave the fishery is slightly less under Alternative 6B because vessels fishing north of 40°10' N. lat. that only land yellowtail rockfish would not be required to have VMS. Alternative 7, is essentially the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. It is likely that most, if not, all vessels under 12 feet in length will not fish in Federal waters and would therefore not trigger the VMS requirement. Under Alternative 7, the estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,172,912 - $7,071,330 year 1, $299,712 - $1,139,530 in subsequent years.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data from 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,036,496 - $6,627,390 year 1, $280,896 - $1,067,990 in subsequent years.

Under Alternative 9 data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $1,563,216 - $5,087,190 year 1, $215,616 - $819,790 in subsequent years.

There is no cost of VMS to the industry under Alternative 10. However, if the RCA requirements are discontinued under Alternative 10 the cost to the directed OA fisheries will likely be quite high as a result of drastically reduced seasons and trip limits. It is also likely that LE fishers would also see season and trip limit reductions to compensate for the higher expected bycatch by the OA directed fisheries.

SOCIO-ECONOMIC ENVIRONMENT	
SAFETY	Changes in search and rescue capability resulting from the requirement to carry and use VMS
Alternative 1 Status quo	Direct impact EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.
Alternative 2 Vessels using longline gear	Direct impact May provide position information that can be used to aid in search and rescue efficiency for 320 OA longline vessels. If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
Alternative 3 Vessels using longline or pot gear	Direct impact & Indirect Impacts Same as Alt.2, but adds 145 directed, 21 Dungeness crab, 6 prawn, and 37 CA halibut vessels using pot gear
Alternative 4A Vessels using longline, pot or trawl gear, except pink shrimp trawl	Direct impact & Indirect Impacts Same as Alt. 2 and 3, but adds approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear (excludes pink shrimp vessels).
Alternative 4B Vessels using longline, pot or trawl gear	Direct impact & Indirect Impacts Same as Alt. 2 and 3, but adds approximately 131 vessels (54, pink shrimp, 23 ridgeback prawn, 14 sea cucumber and 40 CA halibut vessels) using nongroundfish trawl gear.
Alternative 5A Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl and salmon troll	Direct impact & Indirect Impacts Same as Alt. 2, 3 and 4A, plus 658vessels (590 vessels groundfish, 58 CA halibut, and 10 HMS vessels) using line gear to take and retain, possess or land groundfish(excludes salmon troll vessels).
Alternative 5B Vessels using longline, pot, trawl or line gear, except: pink shrimp trawl, HMS longline & line, and Dungeness crab pot gear.	Direct impact & Indirect Impacts Same as Alt. 2, 3, 4A and 5A, except 10 HMS line and 2 longline, 21 Dungeness crab pot are not included, but an additional 234 salmon troll vessels are included. 1,307 vessels total.

SOCIO-ECONOMIC ENVIRONMENT - Continued	
SAFETY	Changes in search and rescue capability resulting from the requirement to carry and use VMS
Alternative 1 Status quo	Direct impact EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.
Alternative 6A Vessels with RCA restrictions	Direct impact May provide position information that can be used to aid in search and rescue efficiency for approximately 1,583 vessels: 349 vessels using longline gear as identified under Alt. 2 plus it includes all 65 Pacific halibut vessels; 193 vessels using pot gear identified under Alt. 3; 77 vessels using trawl gear (approximately 23 ridgeback prawn, 14 Sea cucumber, and 40 CA halibut vessels); 892 vessels using line gear 590 groundfish directed, 58 CA halibut, 234 salmon troll and 10 HMS vessels); and 72 vessels using net gear (25 HMS and 47 CA halibut). If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
Alternative 6B Vessels with RCA restrictions except salmon troll north that retain only yellowtail rockfish	Direct impact & Indirect Impacts Same as Alt. 6A, but affects approximately <58 fewer vessels annually than does 6A because salmon troll vessel fishing north of 40°10' N. lat. that only land yellowtail rockfish would be excluded.
Alternative 7 Vessel >12 ft with RCA restrictions	Direct impact & Indirect Impacts Same as Alt. 6A, but benefits are slightly reduced from those identified under Alt. 6A because approximately 22 vessels/yr (6 longline, 2 pot, and 14 line gear) each less than 12 feet in length, would not be carrying VMS transceivers.
Alternative 8 Excludes all low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal.	Direct impact May provide position information that can be used to aid in search and rescue efficiency for approximately 1,463 vessels: 349 vessels using longline gear 282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 CA halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 CA halibut, and 234 salmon troll vessels). If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
SOCIO-ECONOMIC ENVIRONMENT - Continued	

SAFETY	Changes in search and rescue capability resulting from the requirement to carry and use VMS
Alternative 1 Status quo	Direct impact EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.
Alternative 9 Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	Direct impact May provide position information that can be used to aid in search and rescue efficiency for approximately 1,123 vessels: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 CA halibut and 3 pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). If VMS transceiver unit has distress signal, it may further reduce response time in an emergency. Indirect impacts If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. If fishing opportunity improves and profits to the individual vessel increase there may be fewer of these marginal vessels that tend to display more risk prone behavior including, the tendency to not adequately maintain equipment and vessels.
Alternative 10 No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	Direct impact & Indirect Impacts EPIRBS are the primary devise used to identify a vessel's location in an emergency situation. VHF radios are also used.

4.3.4 Safety of Human life

Direct Impacts on the safety of human life at sea primarily consists of changes in search and rescue capability.

Response time to any incident at sea requires clear communications about the problem and the needs of the vessel's crew, an ability to quickly identify the location of the vessel, and the capability to either provide adequate information or to reach the vessel for an at seas rescue. An EPIRB is an emergency notification devise that is automatically released when a vessel sinks. After the EPIRB is released, it floats to the surface and automatically begins sending out an emergency distress signal that identifies the vessel location. Unfortunately, these devices do not always work as intended and a certain proportion of the units fail to work at all.

Though VMS transceivers are not replacements for EPIRBS, they can aid the USCG in search and rescue efforts when other sources of emergency information are not available. If an EPIRB or other safety system fails to transmit a vessel's last location, or if the vessel's last location is in question, VMS could be used to identify the vessel's last known position. Similarly, if a vessel's position reports fail to be received over a period of time, it may be used to alert processing center staff to a potential problem that can be forwarded to the USCG for further investigation. Though VMS shows where a vessel is located it becomes ineffective should the power be lost or a vessel sinks. Unlike EPIRBS which have their own power source, VMS is dependent on the vessel for power. Most VMS systems have distress buttons and some allow for two-way communications. Having the 2-way communication can aid in obtaining information about vessel safety and medical issues.

Indirect impacts on safety as a result of VMS would result if VMS altered risk prone behavior. When fishing opportunity is reduced and profits are marginal, vessels may display more risk prone behavior and may not adequately maintain equipment and vessels. If VMS results in those fishers who are less dependent on groundfish revenue leaving the fishery, higher catch limits may result for those vessels that remain in the fishery. Though farther removed in time, increases in groundfish revenue from increased trip limits could result in vessels being better maintained. Similarly, if the integrity of the RCA can be maintained, the potential for recovery of overfished stocks is more likely and future harvest rates are more likely to increase

There is a certain degree of danger associated with groundfish fishing, however, little is known about the connection between fisheries management measures and incident, injury, or fatality rates in the fishery. Moreover, little is known about risk aversion among fishers or the values placed on increases or decreases in different risks.

There are safety concerns when small vessels are encouraged to fish in deeper waters and farther from assistance. Extended transits will result in longer exposure to harsh weather conditions, especially during winter months. This problem is compounded by the relatively small size and slow speed of many OA fishing vessels which will make it difficult for them to run from weather or return to port before sea conditions become hazardous. Small vessels are not able to withstand rough seas as well as larger vessels. The VMS provisions currently in regulation set a standard that prohibits groundfish directed vessels from drifting in the RCAs. This provision would apply to the OA fisheries as well.

Comparison of the Alternatives

Safety is expected to vary with the alternatives because of the difference in vessel coverage and the VMS information that may be available in an emergency situation. Table 4.3.1.1. Shows the percent of OA vessels less than 40 feet (ft) in length by dependency on the fishery for November 2000 through October 2001. During this time period, 90% or more of the most groundfish dependent vessels in the nearshore and shelf rockfish fleets were under 40 feet in length. With the creation of the RCAs it is assumed that many of the smaller vessels shifted their efforts off the shelf and in to nearshore areas. However 85% of the slope rockfish vessels and 72%of the sablefish vessels were also under 40 feet in length. When looking at the incidental OA fisheries for this time period, those with more than 50% of the fleet under 40 ft in length were

salmon (72%), Pacific halibut (65%), and Dungeness crab (56%). A large proportion of the less dependent groundfish vessels were also in fleets were more than 50% of the vessels were under 40 feet in length: nearshore (78%) and shelf rockfish (60%). Those alternatives that include the directed longline and pot vessels that are most likely to target slope species may benefit the smaller directed groundfish vessels that travel far from shore. Small vessels may be difficult to locate on the open ocean. If necessary, VMS position data could serve as a secondary source of information for locating these vessels in emergency situations.

No information regarding a vessel's fishing location is provided under Alternative 1, status quo. Alternative 2 maintains the provisions of status quo, but adds the VMS requirements for approximately 282 directed groundfish, 38 Pacific halibut, and 2 California halibut vessels using longline gear. Of the alternatives that require VMS, Alternative 2 requires the smallest proportion of the OA fleet (only 320 vessels using longline gear) to have and use VMS and would therefore provide the least safety benefit of the VMS alternatives.

Alternative 3, includes the same vessels as Alternative 2, but adds the VMS and declaration reporting requirements for approximately 193 vessels (145 directed, 21 Dungeness crab, 6 prawn, and 21 California sheephead vessels) using pot gear. Therefore, Alternative 3 would more vessels would have VMS units that Alternative 2, however there would less vessels than under Alternative 4A and therefore less of a safety benefit than Alternative 4A.

Alternatives 4A and 4B add VMS coverage for nongroundfish trawl vessels to the vessels identified under Alternative 3. The primary difference between the 2 alternatives is that Alternative 4A adds the VMS and declaration reporting requirement for approximately 77 vessels (23 ridgeback prawn, 14 sea cucumber and 40 California halibut vessels) using nongroundfish trawl gear that take and retain, possess or land groundfish. While Alternative 4B includes all of the nongroundfish trawl vessels identified under Alternative 4B plus 54 pink shrimp vessels. Many vessels that fish for pink shrimp are also registered to LE groundfish permits and therefore already have VMS requirements.

Alternative 5A includes the same vessels as Alternative 4A, but adds the VMS and declaration reporting requirements for approximately 590 vessels groundfish, 58 California halibut, and 10 HMS vessels using line gear to take and retain, possess or land groundfish (excludes salmon troll vessels). Alternative 5B includes slightly more vessels than 5A because the number of salmon troll vessels that would be added under this alternative is greater than the number of HMS and Dungeness crab vessels that would not be included. Though alternative 5B does not include vessels in fisheries that are projected to have minimal impacts on overfished species (10 HMS line and 2 longline, 21 Dungeness crab pot), it includes approximately 241 salmon troll vessels.

Alternative 6, which applies to any vessel engaged in commercial fishing to which a RCA restriction applies, includes the largest number of OA vessels. Therefore, Alternative 6A would have the greatest safety benefits because the greatest number of vessels will be required to carry VMS transceivers. Alternative 6B, affects approximately 79 fewer vessels annually than does Alternative 6A, all of which use salmon troll gear. Alternative 7, is almost the same as Alternative 6A because it applies to the same vessels except that vessels less than 12 feet in length would be excluded. Most, if not, all vessels under 12 feet in length are not expected to fish in Federal waters and would therefore not trigger the VMS requirement.

Alternative 8 excludes the low impact OA fisheries, those where the incidental catch of overfished species is projected to be minimal: Dungeness crab pot, spot prawn pot, sea cucumber trawl, ridgeback prawn trawl, HMS line, and California sheephead pot. Data available under this alternative includes 1,463 vessels includes data from: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 145 vessels directed groundfish vessels using pot gear; 40 California halibut vessels using trawl gear, 47 vessels using CA halibut net gear, and; 882 vessels using line gear 590 groundfish directed, 58 California halibut, and 234 salmon troll vessels). Position reports from the seas cucumber, ridgeback prawn, and pink shrimp trawl vessels would not be included under Alternative 8.

Because alternative 9 excludes those vessels with minimal annual catch of groundfish, those that land more than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alterative 8. Under alternative 9 data from 1,123 vessels could be used to maintain the integrity of RCAs from longline, pot, trawl, line, net and other fishing gear impacts. Vessels included under Alternative 9 are: 349 vessels using longline gear (282 directed groundfish, 65 Pacific halibut, and 2 CA halibut); 150 vessels using pot gear (145 groundfish directed, 1 Dungeness crab,2 prawn and 2 sheephead); 9 California halibut 3 and pink shrimp vessels using trawl gear, 15 vessels using CA halibut net gear, and; 597 vessels using line gear 590 groundfish directed, 1 HMS and 6 salmon troll vessels). No OA vessels would be required to have VMS under Alternative 10.

4.3.5 Communities

Fishing communities, as defined in the MSA, include not only the people who catch the fish, but also those who share a common dependency on directly related fisheries-dependent services and industries. Commercial fishing communities may include boatyards, fish handlers, processors, and ice suppliers. People employed in fishery management and enforcement make up another component of fishing communities. Community patterns of fishery participation vary coastwide and seasonally, based on species availability, the regulatory environment, and oceanographic and weather conditions. Communities are characterized by the mix of fishery operations, fishing areas, habitat types, seasonal patterns, and target species. Although unique, communities share many similarities. For example, all face danger, safety issues, dwindling resources, and a multitude of state and federal regulations.

Since 2003, the Council has used a depth-based management strategy to would allow fishing to continue in areas and with gear that can harvest healthy stocks with little incidental catch of low abundance species (overfished species). Stock assessments for four overfished species, bocaccio, yelloweye, canary and darkblotched rockfish indicated that little surplus production is available for harvest. Therefore, measures must be taken to protect these stocks and rebuild them to sustainable biomass levels.

Regulations that lower fishing quotas have historically reduced the income generated by the fishing fleet. When fishing income is reduced, the coastal communities typically suffer in the short- term. Constraints on the groundfish fishery resulting from the need to rebuild overfished species could cause and economic instability of fishery participants and associated fishing communities. However, recovery of fish stocks will help coastal communities and the industry, in the long term. In the long-term, Alternatives 2-7 provide a means to ensure the integrity of the depth-based management areas and thereby mitigate undesirable or greater economic impacts associated with overfished species management. If the RCAs cannot be maintained, it is likely that management measures will need to revert back to simple closed areas and very restrictive limits, which have a greater effect on fishing communities in the short-term.

In the short-term, if the added cost results in large numbers of incidental OA groundfish vessels and vessel that have a low level of dependency on groundfish leaving the fishery, the necessary fishing supplies that would otherwise be purchased by them may result in less sales for supporting businesses. However, since these are primarily incidental OA groundfish vessels, it would be assumed that the gear and supplies they normally purchase for the target fishery would remain unchanged.

There is a risk to low volume processors (addressed in the previous section) if a substantial number of incidental OA groundfish and less dependent fishers exit the fishery to avoid the added cost of VMS. This may particularly be a problem under Alternatives 5A-7, in which most incidental fisheries are included. If fewer incidentally caught groundfish are available, prices to processors and buyers may increase, these increases would then be passed on to the businesses that purchase the fish and the consumer. Such increases may have a negative affect on business in coastal communities that depend on groundfish products for their business.

The level of fleet coverage, that portion of the overall OA fishing fleet that would be required to have VMS and provide declaration reports, is the only difference between the alternatives. The ability to maintain the

integrity of the RCAs is directly related to the level of VMS coverage for OA vessels. In general, the higher the coverage level for vessels that interact with overfished species, the more likely that it is that the integrity of the RCAs can be maintained.

4.4 Cumulative Impacts

Cumulative effects must be considered when evaluating the alternatives to the issues considered in the EA. Cumulative impacts are those combined effects on quality of 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 undertake such actions (40 CFR 1508.7, 1508.25 (a), and 1508.25 (c))

[Section to be completed]

5.0 CONSISTENCY WITH THE FMP AND OTHER APPLICABLE LAWS

5.1 Consistency with the FMP

The socio-economic framework in the Pacific Coast Groundfish FMP requires that proposed management measures and viable alternatives be reviewed and consideration given to the following criteria: a) how the action is expected to promote achievement of the goals and objectives of the FMP; b) likely impacts on other management measures; c) biological impacts; d) and economic impacts, particularly the cost to the fishing industry; and e) accomplishment of one of a list of factors.

GOALS AND OBJECTIVES OF THE FMP

The Council is committed to developing long-range plans for managing the Pacific Coast groundfish fisheries that prevent overfishing and loss of habitat, yet provide the maximum net value of the resource, and achieve maximum biological yield. Alternatives 2- 7 are consistent with FMP goal 1-objective 1, and goal 3-objective 10.

> Goal 1- Conservation: Objective 1 -- maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.
>
> Goal 3- Utilization: Objective 10 -- strive to reduce the economic incentives and regulatory measures that lead to wastage of fish. Also, develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. In addition, promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

ACCOMPLISHMENT OF ONE OF THE FACTORS LISTED IN FMP SECTION 6.2.3.

Under the socio-economic framework, the proposed action must accomplish at least 1 of the criteria defined in Section 6.2.3 of the FMP. Alternatives 2-7 are likely to accomplish objective 2 by providing information to avoid exceeding a quota, harvest guideline or allocation, and objective 13 by maintaining a data collection and means for verification.

5.2 Magnuson-Stevens Conservation and Management Act

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

National Standard 1 requires that conservation and management measures shall prevent overfishing while achieving on a continuing basis, the optimum yield from each fishery for the United States fishing industry. The proposed action is to expand a monitoring program to monitor the integrity of closed areas that were established to protect overfished species. Information provided under Alternatives 2- 7 reduce the risk of overfishing because they would provide information that could be used to reduce the likelihood of overfishing while allowing for the harvests of healthy stocks. Because Alternative 6A and 7 provides the most information, they would have the least risk, while Alternative 1 has the greatest risk.

National Standard 2 requires the use of the best available scientific information. The proposed action is to expand a VMS program to monitor the integrity of closed areas that were established to protect overfished species. Data collected under Alternatives 2-7 would be used to understand the level of fishing effort and how it was distributed. When combined with data from the existing federal observer program, it could be used to more accurately estimate total catch.

National Standard 3 requires, to the extent practicable, that an individual stock of fish be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination. This standard is not affected by the proposed action to expand a monitoring program to monitor the integrity of closed areas.

National Standard 4 requires that conservation and management measures not discriminate between residents of different States. None of the alternatives would discriminate between residents of different States.

National Standard 5 is not affected by the proposed actions because it does not affect efficiency in the utilization of fishery resources.

National Standard 6 requires that conservation and management measures take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches." All alternatives meet this standard.

National Standard 7 requires that conservation and management measures minimize costs and avoid unnecessary duplication. Measures were taken to minimize the costs of a monitoring program by reducing the time burden and cost of declaration reports - they would only be required when vessel changes gears rather than on every trip.

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

National Standard 9 requires that conservation and management measures minimize bycatch and minimize the mortality of bycatch. NMFS is required to "promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality. The proposed action is consistent with this standard.

National Standard 10 Conservation and Management measures shall, to the extent practicable, promote the safety of human life at sea. Alternatives 2-7 have safety benefits. Thought VMS is not an emergency response system it has been used in search an rescue to determine a vessels last known position and the VMS systems provides for a distress signal that may also reduce response time in an emergency. Alternatives 6A and 7 have the greatest safety benefits because requires VMS for the largest portion of the OA fleet, followed by 5B and then 6B.

Essential Fish Habitat This action will affect fishing in areas designated as essential fish habitat (EFH). The proposed action is to expand a program to monitor the integrity of closed areas that were established to protect overfished species. The potential effects of the proposed actions are not expected to have either no adverse effect on EFH, to have a positive effect resulting from reduced fishing effort in critical areas, or to have a positive effect if used to support regulations to restrict fishing in areas to protect habitat. No EFH consultation is warranted for this action.

5.3 Endangered Species Act

NMFS issued Biological Opinions (B.O.) under the ESA on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999 pertaining to the effects of the groundfish fishery on chinook salmon (Puget Sound, Snake River spring/summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central Valley spring, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal), chum salmon (Hood Canal summer, Columbia River), sockeye salmon (Snake River, Ozette Lake), and steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, northern California, southern California). During the 2000 Pacific whiting season, the whiting fisheries exceeded the 11,000 fish chinook bycatch amount specified in the Pacific whiting fishery B.O. (December 19, 1999) incidental take statement, by approximately 500 fish. In the 2001 whiting season, however, the whiting fishery's chinook bycatch was about 7,000 fish, which approximates the long-term average. After reviewing data from, and management of, the 2000 and 2001 whiting fisheries (including industry bycatch minimization measures), the status of the affected listed chinook, environmental baseline information, and the incidental take statement from the 1999 whiting B.O., NMFS determined that a re-initiation of the 1999 whiting BO was not required. NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. This proposed rule implements a data collection program and is within the scope of these consultations. Because the impacts of this action fall within the scope of the impacts considered in these B.O.s, additional consultations on these species are not required for this action.

5.4 Marine Mammal Protection Act

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, the Stellar sea lion population off the West Coast is listed as threatened under the ESA and the fur seal population is listed as depleted under the MMPA. Incidental takes of these species in the Pacific Coast fisheries are well under their annual PBRs. None of the proposed management alternatives are likely to affect the incidental mortality levels of species protected under the MMPA. The West Coast groundfish fisheries 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. Implementation of Alternatives 2-7 are expected to benefit MMPA species because they would allow observer data and data from other sources to be joined to the VMS data to better understand the extent of potential fishing related impacts on various marine mammal species.

5.5 Coastal Zone Management Act

The proposed alternatives would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination has been submitted to the responsible state agencies for review under Section 307(c)(1) of the Coastal Zone Management Act (CZMA). The relationship of the groundfish FMP with the CZMA is discussed in Section 11.7.3 of the groundfish FMP. The groundfish FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs. The recommended action is consistent and within the scope of the actions contemplated under the framework FMP. Under the CZMA, each state develops its own coastal zone management program which is then submitted for federal approval. This has resulted in programs that vary widely from one state to the next.

5.6 Paperwork Reduction Act

[Section to be completed]

5.7 Executive Order 12866

This action is not significant under E.O. 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.

5.8 Executive Order 13175

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

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

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

5.9 Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished populations of many native bird species. The Act states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The Migratory Bird Treaty Act prohibits the directed take of seabirds, but the incidental take of seabirds does occur. None of the proposed management alternatives, or the Council recommended action are likely to affect the incidental take of seabirds protected by the Migratory Bird Treaty Act. Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) is intended to ensure that each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations develops and implements a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service that shall promote the conservation of migratory bird

populations. Currently, NMFS is developing an MOU with the U.S. Fish and Wildlife Service. None of the proposed management alternatives are likely to have a measurable effect on migratory bird populations.

5.10 Executive Order 12898 (Environmental Justice) and 13132 (Federalism)

There is no specific guidance on application of EO 12898 to fishery management actions. The EO states that environmental justice should be part of an agency's mission "by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority or low-income populations." These recommendations would not have federalism implications subject to E.O. 13132. State representatives on the Council have been fully consulted in the development of this policy recommendation.

6.0 REGULATORY IMPACT REVIEW AND REGULATORY FLEXIBILITY ANALYSIS

The RIR and IRFA analyses have many aspects in common with each other and with EAs. Much of the information required for the RIR and IRFA analysis has been provided above in the EA. Table 6.0.1 identifies where previous discussions relevant to the EA and IRFA can be found in this document. In addition to the information provided in the EA, above, a basic economic profile of the fishery is provided annually in the Council's SAFE document.

Table 6.0 1 Regulatory Impact Review and Regulatory Flexibility Analysis

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

[Section to be completed]

6.1 Regulatory Impact Review

[Section to be completed]

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

Requirements of an IRFA

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

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

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

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

6.2 Initial Regulatory Flexibility Analysis

When an agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an Initial Regulatory Flexibility Analysis (IRFA) that describes the impact on small businesses, non-profit enterprises, local governments, and other small entities. The IRFA is to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities (attachment 1). To ensure a broad consideration of impacts on small entities, NMFS has prepared this IRFA without first making the threshold determination whether this proposed action could be certified as not having a significant economic impact on a substantial number of small entities. NMFS, must determine such certification to be appropriate if established by information received in the public comment period.

1) A description of the reasons why the action by the agency is being considered.

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

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

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

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

6) A summary of economic impacts.

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

7.0 List of Preparers

This document was prepared by the Northwest Regional Office of the NMFS. 8.0 References

[Section to be completed]

8.0 References

XXX INCOMPLETE - ADD NEW XXX

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