DRAFT

MEETING SUMMARY

Highly Migratory Species Management Team
Highly Migratory Species Advisory Subpanel
Pacific Fishery Management Council

United States Tuna Foundation
Conference Room
1 Tuna Lane
San Diego, California 92101
August 3-5, 2005

HMSMT Members Present

Steve Crooke, CDFG
Michele Culver, WDFW
Suzy Kohin, NMFS SWFSC
Jean McCrae, ODFW
Liz Petras, NMFS SWR

HMSAS Members Present

Lillo Augello, Southern Processor
Pete Dupuy, Commercial At-large
August Felando, Commercial Purse Seine
Steve Fosmark, Gillnet Fisheries Representative
Wayne Heikkila, Commercial Troller
Russell Nelson, Recreational At-large
Bob Osborn, Private Recreational
Bill Sutton, Commercial At-large

Others

Gary Burke, Commercial Fisherman
Jim Carretta, NMFS SWFSC
Donna Dealy, NMFS SWFSC
Tomo Eguchi NMFS SWFSC
Lyle Enriquez, NMFS SWR
Tina Fahy, NMFS SWR
Peter Flournoy, AFRF
Svein Fougner, HLA
Rich Hamilton, Recreational Fishing Alliance
Craig Heberer, NMFS, SWR
Ken Hinman, National Coalition for Marine Conservation
Chuck Janisse, FISH
John LaGrange, Commercial Fisherman
Keith Longman, Commercial Fisherman
Mike McCorkle, Commercial Fisherman
Lia Protopapadakis, NMFS SWR
Erika Robins, NMFS SWR
Carlo Sanfilippo
Petro Sanfilippo
Annie Sartur, Oceana
Stephen Stohs, NMFS SWFSC
Emanuel Terzoli
Marija Vojkovich, CDFG
Peter Volauz

WEDNESDAY, AUGUST 3, 2005 – 1 P.M.

HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM MEETING

A. Call to Order

1. Introductions

2. Approval of the Agenda

The agenda was approved as presented.

B. Modification of the Drift Gillnet Closure Area – Identify Possible Options for Presentation to Highly Migratory Species Advisory Subpanel

Jim Carretta and Liz Petras provided a brief overview of the protected resources related work to date, focusing on the June 2, 2005, paper by Jim Carretta discussing leatherback sea turtle incidental take CPUE. Jim emphasized the need to avoid over-stratifying the data because it is so limited: 23 takes in more than 7,000 sets. The choice of geographic stratification will be somewhat subjective, but should rely on what knowledge there is about the biology of the animal and how it interacts with oceanographic conditions. He decided that Point Conception is a reasonable latitude reference for stratifying the data for these reasons. The CPUE south of Point Conception is much lower than north of that line.

Chuck Janisse ran through historical data on leatherback takes and number of sets by year and month.

It was noted that the briefing paper indicated there was a lot of variability in terms of potential takes, reflected by the 95% CI values. Jim Carretta also noted that CPUEs by themselves are not the only factor; how oceanographic and biological factors can change over time should also be considered.

Steve Stohs asked if the difference between CPUEs north and south of Point Conception was due to different fishing methods. Jim Carretta said that there was nothing in the available data to suggest that. Steve Crooke asked if water temperature was a discernable factor and Jim responded that it would be useful to consider if the data were available. So would the distribution of prey.

Chuck Janisse cited the Barlow paper,[*] which showed different CPUEs by latitude.

Jim Carretta said that Barlow (as cited in Gallaway) used a general additive model that basically fit the take rates to latitude. However, the samples on which this is based—the number of leatherback takes within each of the latitude zones—were very small. Also, the model treats latitude as a continuous variable, with the highest CPUE values observed in the range of latitudes between 36.5 and 38 degrees. Jim Carretta pointed out that this was in the very area that is being considered for reopening of the current closure.

Michele Culver brought up the issue of unobserved or unobservable vessels, questioning whether the sample was truly random. Jim replied that there was no reason to think it was not a random sample, although a statistical comparison of logbook versus observer data could be done to explore this issue. Michele followed up by asking if a different CPUE is applied to unobserved boats. Jim reiterated that given the available data and the assumption that observed sets are statistically representative, there is not

[*] Barlow, J. [2001]. *Analysis of turtle bycatch rates in response to recommendations made at the 2001 Pacific Offshore Cetacean Take Reduction Team meeting*; Appendix 3 in Gallaway, B.J. 2001. *Leatherback sea turtles and the California/Oregon drift gillnet fishery*. Buellton (CA): California Seafood Council. November 2001.

much more you can do than assign an average CPUE value to all vessels. He went on to note that the Gallaway report suggests a higher leatherback CPUE west of 125° W longitude. There was some discussion of the possible reasons that might support such a difference.

The discussion then turned to the area closure proposal put forward by Steve Fosmark. This led to a discussion of recent satellite tagging data showing the movements of tagged leatherbacks from the Monterey, California area. These data suggest leatherback turtles migrate between nesting areas in the Western Pacific and foraging areas off of Monterey. Tagged leatherbacks generally moved southwest from the Monterey area. There was discussion of what causes satellite tags to stop working and whether it indicates the turtle died.

In response to a question about sea turtles killed in other parts of the Pacific, Tina Fahy said that the environmental baseline in the Biological Opinion (BiOp) would incorporate information on takes for the population as a whole. She briefly reviewed current sources of mortality Pacific-wide and noted ongoing conservation efforts. She also described the current stock status of Western Pacific versus Eastern Pacific leatherback populations. Eastern Pacific stocks are in much worse shape, showing severe decline, while the Western Pacific population is stable or increasing. Available data suggest about a 40:1 ratio of Western versus Eastern Pacific stocks in the drift gillnet (DGN) fishing area. This would be considered in the BiOp.

Chuck Janisse asked what the range of allowable incidental take is likely to be for this action. Liz Petras said a definite number can't be given, but it is likely to be similar to the levels provided in past BiOps. The 2000 BiOp for the DGN fishery had six leatherback mortalities over three years. Also, a 61% mortality rate is assumed. She discussed population viability analysis, another tool that would be used in the evaluation.

Pete Dupuy said the task was to find way of increasing fishing opportunity within the constraints of existing U.S. laws and regulations. This may not seem fair considering that most sources of mortality are not due to U.S. fishermen, but it's the situation that has to be dealt with.

The discussion then turned to developing alternatives involving an overall limit on the number of sets that could be made in the northern closed area. One question was how many sets could be supported given the average CPUE north of Point Conception and the likely acceptable level of sea turtle takes.

Chuck Janisse expressed some frustration concerning the difficulty in developing alternatives when there was no definitive take limit for leatherbacks. He also asked if there is anything the DGN fishery can do to reduce the mortality rate used from 61%. Janisse noted that the mortality rate for leatherbacks externally hooked with longline gear is 10% (if all gear is removed, for externally hooked leatherbacks with gear attached, mortality rates vary from 15% to 30%) and wondered why the Council did not act to allow testing of this gear as an alternative to the DGN fishery.

Liz Petras indicated that the DGN fishery has likely declined, perhaps to a level of 750 sets annually in the currently closed area, which with the CPUEs being used could result in around five leatherback mortalities.

August Felando asked some questions about the difference in the incidental take statement (ITS) in the 1997 versus the 2000 BiOps and why there were so much lower in the latter, and whether the 2000 numbers were valid. The annual ITS established in the 2000 BiOp was two leatherback mortalities (of three takes) in the southern DGN fishery and this was considered no jeopardy in the 2000 and 2004 HMS BiOp. It was suggested that when considering alternatives for opening the northern DGN fishery expected take levels should be consistent with other no jeopardy BiOps.

There was further discussion of possible approaches to structuring the alternatives using closed areas, set limits, or leatherback incidental take limits. These alternatives could be prosecuted under an exempted fishing permit (EFP), which would limit the number of boats that could participate (i.e., fish in the closed area under these limits). Ranges of values for these different approaches were discussed. Chuck Janisse suggested the alternatives break down to two approaches: establishing take or effort limits (similar to the situation in the Hawaii longline fishery) with increased observer coverage for fishing inside the current closed area or modifying the current closed area and continue with the current observer coverage level (about 20%) for fishing outside of it.

There was further discussion of the viability of considering area closure alternatives.

The discussion then turned to observer coverage. It was recognized that a fishery in the current closed area would probably have to have 100% observer coverage. If the program costs for this are prohibitive that could preclude this approach. Michelle Culver also asked whether observer data could be compiled close enough to real time to allow any kind of take limit alternative (under which the fishery would close when the limit is reached). The possibility of electronic monitoring (i.e., video monitoring) was put forward as a lower cost alternative to observers.

Michele Culver outlined eight alternatives, including no action, which included variations on closed area modifications, leatherback take limits, and set limits.

Steve Crooke said these alternatives should be looked at to see if they could be reduced to a fewer number.

Craig Heberer said the alternatives shouldn't be limited arbitrarily as that risks problems in any litigation.

Suzy Kohin suggested including some other closed area alternatives, such as modifying the southern boundary so it goes due west from Point Sur and bringing the northern boundary down to 40° N latitude. This led into a further discussion of closed area alternatives. However, there was a lukewarm reception because of the previous discussion about how the limited stratification of CPUEs means that closed area variations would show limited positive results in any analysis of projected take.

Tomo Eguchi discussed his recent work modeling fishery-leatherback interactions based on telemetry and logbook data.

Pete Dupuy discussed limiting set duration as a way of limiting sea turtle mortality.

The meeting concluded with a discussion of what would be presented to the Advisory Subpanel the next day and how to coordinate the presentation of the EFP protocol to the Council (scheduled for adoption for public review in September) and the fact that the DGN alternatives involve an EFP, which would have to be considered on a different review cycle from what is proposed in the protocol. The team concluded that the best approach would be to recommend that the protocol come into effect for fisheries that would occur during the 2007 fishing year (April 1, 2007-March 31, 2008). An interim protocol would be in effect for fisheries in the 2006 fishing year (April 1, 2006-March 31, 2007), which would just require Council consideration at any two meetings.

Peter Flournoy mentioned that NMFS received an application involving towing a net pen for bluefin tuna sea farming into U.S. waters to receive fish. He wondered if the Team and Advisory Subpanel should discuss it the next day and provide comments on the application.

THURSDAY, AUGUST 4, 2005 – 8 A.M.

HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM MEETING
HIGHLY MIGRATORY SPECIES ADVISORY SUBPANEL
JOINT MEETING

A. Call to Order

1. Introductions

2. Approval of the Agenda

The agenda was approved with the addition of a discussion of the bluefin tuna transshipment permit application.

B. Modification of the Drift Gillnet Closure Area – Develop Preliminary Range of Alternatives

The team reviewed the previous day's discussion for the benefit of the Advisory Subpanel. Michele Culver presented the range of alternatives that had been developed.

Russell Nelson recommended adding an additional leatherback take limit alternative of one mortality. Although possibly not feasible for a viable fishery opportunity, it would strengthen the NEPA analysis.

Steve Fosmark said he wanted to make sure the area outside the closed area, considering his proposal for a change in the southern boundary, would be subject to the status quo 20% observer coverage. This would provide an opportunity for fishery participants while they waited for an available observer, which would be necessary to fish inside the closed area under the EFP. Furthermore, those fishing further south shouldn't be penalized as far as a requirement to carry an observer, since the takes were so much lower in that area.

Steve Fosmark's proposal, and how the modified southern boundary would work, was discussed. Fosmark's proposal would close an area between Pt. Sur and Pt. Arena and out from Monterey Bay to DGN fishing to protect sea turtles.

The team went over some of the issues they had worked out yesterday, explaining to the Subpanel members about the incidental take that might be permitted and the fact that a "hard" number cannot be identified before the BiOp is completed. They reviewed the likely number of sets that would be possible (650-1,000) and how this relates to leatherback takes.

Mechanisms for real-time reporting of takes were discussed, which might be necessary for a take limit approach.

Procedural aspects of developing the proposal were discussed, including the difference between using an EFP and a regulatory or FMP amendment. Michele Culver said the Advisory Subpanel should discuss how best to determine which vessels would participate in the EFP while the Team and NMFS are developing the NEPA analysis.

There was a discussion of the geographic distribution of past fishing effort, how many fishermen have likely left the fishery rather than shifting fishing area, and how many fishermen would be interested in participating in the EFP. Steve Fosmark said that the boats out of Crescent City, Eureka, San Francisco, and Morro Bay have for the most part not fished since the closed area was implemented.

Gary Burke talked about the relationship between temperature fronts and the distribution of swordfish and sea turtles.

Ken Hinmen expressed concern about including an incidental take limit as high as nine leatherback turtles. Although he understood the need for a range of alternatives, this signaled to the public that a number that high is considered acceptable. Steve Crooke responded by saying that presenting such a range is necessary since it's not possible to know what is an acceptable number until NMFS conducts the BiOp. Liz Petras said the NEPA document needs to provide a robust analysis, which uses analytical methods consistent with what will be used in the BiOp. It's not possible to say with certainty what the ITS will result in, but as discussed before, take limits consistent with past BiOps can be identified.

Jim Carretta then presented his analysis of incidental take CPUE, similar to the presentation to the team on the previous day.

Pete Dupuy reiterated his point from the previous day of focusing on the objective of providing fishing opportunity, recognizing the constraints established by the ESA.

A discussion of the mortality rate that would be used in the analysis then ensued. Craig Heberer asked about whether observer data and other information could be used to improve assessments of sea turtle mortality under different capture conditions, which could be used in computing mortality rates for future BiOps. Jim Carretta pointed out the difficulty in handling animals as large as leatherback turtles.

The group then engaged in a discussion similar to what occurred the previous day with respect to the stratification of leatherback incidental take CPUE estimates. Chuck Janisse noted that, given observers won't be available to cover all fishing effort under an EFP, the alternatives should be structured so as to allow fishing in the closed area if (and only if) an observer is on the boat, even if the target level of effort cannot be met. This would make the alternatives still viable even if the funding did not come through for the needed level of observer coverage.

Michele Culver suggested that the action be viewed in light of three sequential analyses. First the HMSMT will do a preliminary analysis for the Council action at the November meeting (selecting a range of alternatives for public review). Then a NEPA document would be prepared for Council final decision in March 2006. Finally, NMFS PRD would prepare a BiOp analyzing the preferred alternative. In light of this approach, area closures could still be considered for management purposes, even if the analytical methods (i.e., limited spatial stratification of CPUE) can't distinguish the impacts of area closures. Closed areas could be considered in the preliminary analysis and NEPA document on a qualitative level. Liz Petras noted the BiOp can contain conservation recommendations, which could include closed areas.

The Advisory Subpanel and Team then discussed whether using an EFP was the best way to go. Craig Heberer pointed out that whether the action was an EFP or regulatory amendment, the analyses would be the same.

Potential problems with requiring 100% observer coverage for fishing in the closed area were discussed. For example, vessels rated "unobservable" would not be able to participate. An alternative would be to look into video monitoring.

Steve Fosmark suggested establishing a limit on the number of sets that can be made on a single trip to prevent "observer hoarding" where a fishermen would maximize the opportunity of having an observer aboard to the detriment of other participants. This led to a discussion of how to set up such a limit, for example by limiting the length of trips directly.

In terms of an upper and lower number of sets for the purposes of establishing limits, the lower end of the range is established by the observer program definition of a trip as having more than five sets. Bill Sutton said 10 sets is often a target in terms of economic viability and could represent the upper end in terms of establishing a limit on the number of sets per trip. There was some discussion of "water hauls" in relation to a per-trip limit on sets. The Advisory Subpanel agreed that Steve Fosmark's idea of a limit on trip length should be included in the alternatives.

It was recognized that at this point the alternatives represent management approaches (closed areas, incidental take limits, set limits) and the Council is likely to combine elements of these approaches in identifying a preferred alternative. For that reason the Advisory Subpanel probably should not advocate strongly for any one approach at this point.

Russell Nelson suggested the need to limit any future reentry of effort into the fishery in response to management changes. Others argued that social and economic changes resulting from the current closure make it unlikely the fishery will ever expand in the future. It was also recognized that this would require establishing a limited entry program, which could not be accomplished in time to implement an EFP or other action by August 2006. Looking into limited entry could be part of a long-term program, which would eventually replace the EFP.

The group discussed the use of Point Conception to stratify incidental take CPUE and how this might play into different management approaches.

The Advisory Subpanel discussed the closed area proposal presented in the Gallaway report and decided it should not be included in the range of alternatives.

The group further reviewed the alternatives as they had been developed up to that point.

C. Management Regime for High Seas Longline Fishery – Identify Proposed Action and Management Concepts

Kit Dahl briefly reviewed the reason this item was placed on the agenda. He noted the Council discussed the issue at the June Council meeting without providing specific direction to the HMSMT. They did, however, form the Ad Hoc HMS Management Committee composed of Council members to identify options for moving forward on the issue.

Michele Culver said the team is waiting for direction from the Council, which was not provided at the June meeting. Until the Council or the Ad Hoc HMS Management Committee provides such direction there is little the HMSMT can do on this issue. There is some frustration because of the previously stated desire to consider both the DGN and longline actions in concert with respect to sea turtle impacts.

There was some discussion of the current status of the Hawaii fishery. Svein Fougner said the Hawaii Longline Association was satisfied with the regulatory setup to date, although they believed the set limit component (tradable set certificates) should be eliminated. Craig Heberer pointed out that Hawaii-permitted vessels can currently fish out of the West Coast according to the regulations if they also obtain an HMS permit. Under these dual permits they could land fish on the West Coast under the HMS permit while targeting swordfish under the Hawaii permit, while complying with the associated regulations. The issue is whether there will be enough set certificates remaining, or whether the incidental take limit for leatherbacks or loggerheads had been reached, such as to allow a fall fishery out of the West Coast. These problems could be addressed if the WPFMC instituted a seasonal allocation of set certificates or the incidental take limit.

Russell Nelson underscored the general tenor of the conversation by emphasizing that the Team and Advisory Subpanel are in policy limbo until the Council provides clear direction on this issue. Wayne Heikkila concurred, saying the Ad Hoc HMS Management Committee should “get off the dime.”

Marija Vojkovich said she was frustrated at how difficult it was to understand how the three fisheries in question—the Hawaii swordfish fishery, DGN, and any potential West Coast longline opportunity—potentially interact in terms of sea turtle impacts. Such an understanding needs to be a starting point for any consideration of action.

Craig Heberer followed up with the view that it is imperative for the Pacific Council to collaborate with the WPFMC on the shallow-set longline issue, given the overlap between any Hawaii and West Coast fishery, especially with respect to any associated sea turtle impacts.

Michele Culver said the Team proposed coming back to the Council with alternatives for both the DGN and longline fisheries so they could be considered together in a BiOp. However, the Council only provided direction on addressing the DGN fishery, so currently this is not possible.

Liz Petras said the longline fishery could be considered in the DGN BiOp as a future action. However, the analysis of the shallow longline fishery would require a separate consultation and any takes authorized for the DGN fishery would affect the environmental baseline used in the shallow longline fishery action consultation.

Lilo Augello pointed out that foreign fisheries have a much greater impact on sea turtles yet it is U.S. fishermen that are penalized.

There was some discussion of a timeline for Council action, with the possibility of permitting the fishery to resume by 2007.

The Advisory Subpanel agreed to request the Ad Hoc HMS Management Committee to "take action as soon as possible to provide guidance to the Management Team." If possible, the Council could provide guidance at the September Council meeting, if this item were put on the agenda.

Pete Dupuy noted that if the action area were looked at differently, it could yield quite different results as far as any protected species impacts. For example, it might be worth considering a fishery only east of 130° W longitude.

There was a brief discussion of the permit application received by NMFS for the transshipment of bluefin tuna to net pens in Mexican waters.

FRIDAY, AUGUST 5, 2005 – 9 A.M.

HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM MEETING

D. Status of SAFE Document and Schedule for Completion

The Team began by reviewing the SAFE outline and discussing what had been completed to date. This included a discussion of the planned list of tables with agreement on which tables could be consolidated so as to reduce the task of completing them.

Inclusion of information on sea turtle bycatch in HMS fisheries was discussed. Michele Culver said this information should be included in the section entitled research and data needs, and monitoring reports.

The list of future additions to the SAFE was discussed.

The inclusion of Pacific-wide catch data was discussed. Peter Flournoy urged caution as to how data on Canadian albacore landings are presented because this could be used in future negotiations. It was agreed there should be a table comparing Pacific-wide landings to West Coast landings by species.

The draft section on status of stocks prepared by Suzy Kohin was reviewed. Whether to include any discussion of stock assessment conducted in the current year was raised. It was agreed that the SAFE should only discuss stock assessments through 2004. A discussion of how stock assessments should be evaluated ensued. Information in the SAFE should also be consistent with the Report to Congress.

The research and data needs, and monitoring reports section was further discussed. It was agreed a description of port sampling programs should not be included in this section because of their limited scope, but the observer program description should be included. Peter Flournoy said the research and data needs list, which is the same as in the FMP, should be prioritized.

The Team discussed the schedule for completing the SAFE. It was decided that the requisite material could not be completed for the September Council meeting and a new deadline of September 28 was established for receipt of materials at the Council office. Authors would circulate their sections by September 12 for review by other Team members.

C. Tasking/scheduling for Development of Drift Gillnet Fishery Closed Area Modification Alternatives Analysis for November Council Meeting

The Team recommended putting a copy of the draft meeting summary and a list of the DGN alternatives in September briefing book as an informational item.

Liz Petras would begin working on the preliminary analysis of turtle impacts for the DGN alternatives. NMFS SWR would also compile information on potential observer coverage levels. Michele Culver will provide a written description of the alternatives.

There was a discussion of the EFP application. The Team thought that Federation of Independent Seafood Harvesters (FISH) would be the applicant. The relation between the EFP (format and timing of submission) and the overall process (NEPA document, Council decision-making) was discussed.

The team agreed they should hold a two-day meeting the week of October 2 to review the preliminary analysis of the DGN alternatives and cover any additional tasks in preparation for the November Council meeting briefing book deadline (October 12). This could also be an opportunity for the Team to meet with the Ad Hoc HMS Management Committee.

ADJOURN

Attachments: Preliminary Alternatives for Drift Gillnet Fishery
Background information on leatherback turtle (Dermochelys coriacea) takes in the large-mesh drift gillnet fishery off California, with comments on the calculation of leatherback turtle catch per unit effort (CPUE). Report by Jim Carretta, NMFS SWFSC
Revised HMS SAFE Outline

PRELIMINARY ALTERNATIVES FOR DRIFT GILLNET FISHERY

Fishing Area (Pick 1)

1. Status quo – keep current closed area in place (No Action)

2. Steve Fosmark proposal (i.e., have turtle "conservation" zone and allow fishing north and south of the zone); includes 100% obs coverage in northern area and status quo coverage (20%) in southern area, and shift in northern boundary of southern area

   (Note: This alt. requires a new BiOp for southern area because of boundary shift; the HMSMT cannot analyze this proposal and re-do the BiOp for southern area in time for 2006 fishery)

3. Steve Fosmark proposal, without shift in northern boundary of southern area

4. Removal of current closed area

Turtle Conservation Measures (Pick 1)
(Note: These measures apply to the area currently closed)

5. Mortality limit for leatherback turtles (fishery would revert to status quo when limit is reached), 100% observer coverage (i.e., cannot fish unless carry observer onboard), real-time reporting requirement
   a. Turtle mortality cap = 1
   b. Turtle mortality cap = 3
   c. Turtle mortality cap = 6
   d. Turtle mortality cap = 9

6. Limit on number of sets (fishery would revert to status quo when limit is reached), 100% observer coverage (i.e., cannot fish unless carry observer onboard)
   a. Set limit = 500
   b. Set limit = 750
   c. Set limit = 1,500

Management Response
Alt. 5 closes fishery in northern area when turtle cap is reached. Under alt. 6, the number of sets is used as a proxy for the estimated amount of turtle mortalities; if the amount of turtle mortalities exceeds the amount estimated in the ITS, then triggers re-consultation.

Long-Term Management (Optional)

7. Direct HMSMT to develop plan amendment for long-term DGN effort limitation program (concurrent with EFP to implement fishery in the interim)

Revised 5 August 2005 (correction of Figure 4.)

Background information on leatherback turtle (Dermochelys coriacea) takes in the large-mesh drift gillnet fishery off California, with comments on the calculation of leatherback turtle catch per unit effort (CPUE).

Jim Carretta
Protected Resources Division
Southwest Fisheries Science Center
National Marine Fisheries Service
8604 La Jolla Shores Drive
La Jolla, CA 92037

One of the Highly Migratory Species Management Team (HMSMT) agenda items for 2005 is to examine the potential impact of re-opening portions of the large-mesh swordfish and thresher shark drift gillnet fishery that have been under area closures since 2001 to protect leatherback sea turtles. In their May 2005 meeting in La Jolla, the HMSMT requested that the Protected Resources Division calculate leatherback CPUE for different regions within this fishery; specifically the area south of Point Sur, California (latitude 36 degrees), and another region north of 40 degrees latitude. Jim Carretta cautioned that relatively low take rates of leatherbacks could be found on small geographic scales purely by chance (through geographic overstratification) because leatherback takes are rare events in this fishery (23 observed in approximately 7,000 sets through early 2004)[1]. It is inadvisable to calculate CPUE values for such small regions as a tool for projecting future takes. Leatherback turtles are, however, more common north of Point Conception, California (latitude 34.45 degrees), thus, separate CPUE calculations for areas north and south of Point Conception are more appropriate, as these two regions coincide with major differences in oceanographic water masses, currents, and fauna. As such, they better represent "ecological strata", rather than geographical strata.

[1] Peter Dutton of the Protected Resources Division's Sea Turtle Program noted at the May 2005 meeting that it was important to include biological information such as leatherback foraging habitat preferences and known migratory pathways in any decision-making regarding the relaxation of area closures or the determination of potential fishery takes. He further emphasized that foraging areas and migratory pathways may vary inter-annually, depending on prevailing oceanographic conditions.

Of the 23 observed leatherback takes, only 2 occurred south of Point Conception, CA (N 34° 27' latitude) from 4,090 observed sets (~0.5 takes/1000 sets). The two takes observed south of Point Conception were in December and January. In comparison, there were 21 observed takes from 2,871 observed sets north of Point Conception (~7 takes/1000 sets). Fourteen of the 21 observed takes occurred in October; the remaining takes were in September (4), November (2) and December (1). Of all 23 takes, thirteen turtles were retrieved dead, nine alive, and one was recorded as 'unknown'. The location of all 23 observed leatherback takes in this fishery are shown in Figure 1. The location of observed sets for the period 1990 – January 2004 are shown in Figure 2.

To examine leatherback CPUE in the drift gillnet fishery, a bootstrap analysis was performed on the actual set data to generate a distribution of "pseudo-CPUE values" for the regions south and north of Point Conception,. Simply, sets were randomly selected with replacement from the actual set data until the number of random sets was equal to the number of observed sets. This selection of random sets constituted "one bootstrap sample". A CPUE value was calculated from each bootstrap sample and this was repeated 1,000 times, resulting in a distribution of 1,000 "pseudo-CPUE values". Confidence intervals (CI) for this distribution were obtained by using the percentile method, where the lower 95% CI represents the 2.5th percentile of the bootstrap distribution and the upper 95% CI represents the 97.5th percentile. The actual set data and bootstrap CPUE values are included in the Excel file "LeatherbackCPUE.xls" (available upon request from Jim.Carretta@noaa.gov).

For the area south of Point Conception, the bootstrap mean CPUE is 0.5 leatherbacks per 1,000 sets, with a 95% CI of zero to 1.4 leatherbacks per 1,000 sets (Figure 3). North of Point Conception, the bootstrap mean CPUE is 7.7 leatherbacks per 1,000 sets, with a 95% CI of 4.5 to 10.8 leatherbacks per 1,000 sets (Figure 4). These CPUE values merely reflect the historical take rates in the fishery over large areas, and future CPUE of leatherbacks cannot be "predicted" based on these historical CPUE data. Much new information about the foraging areas and migratory pathways of leatherback turtles has been collected in this region since the area closure was implemented in 2001[2]. This biological information should be incorporated in determining which, if any, areas to re-open in this fishery, as historical CPUE values examined alone are not informative enough for good decision-making.

[2] Peter Dutton, Southwest Fisheries Science Center, Marine Turtle Program, 8604 La Jolla Shores Drive, La Jolla, CA 92037.

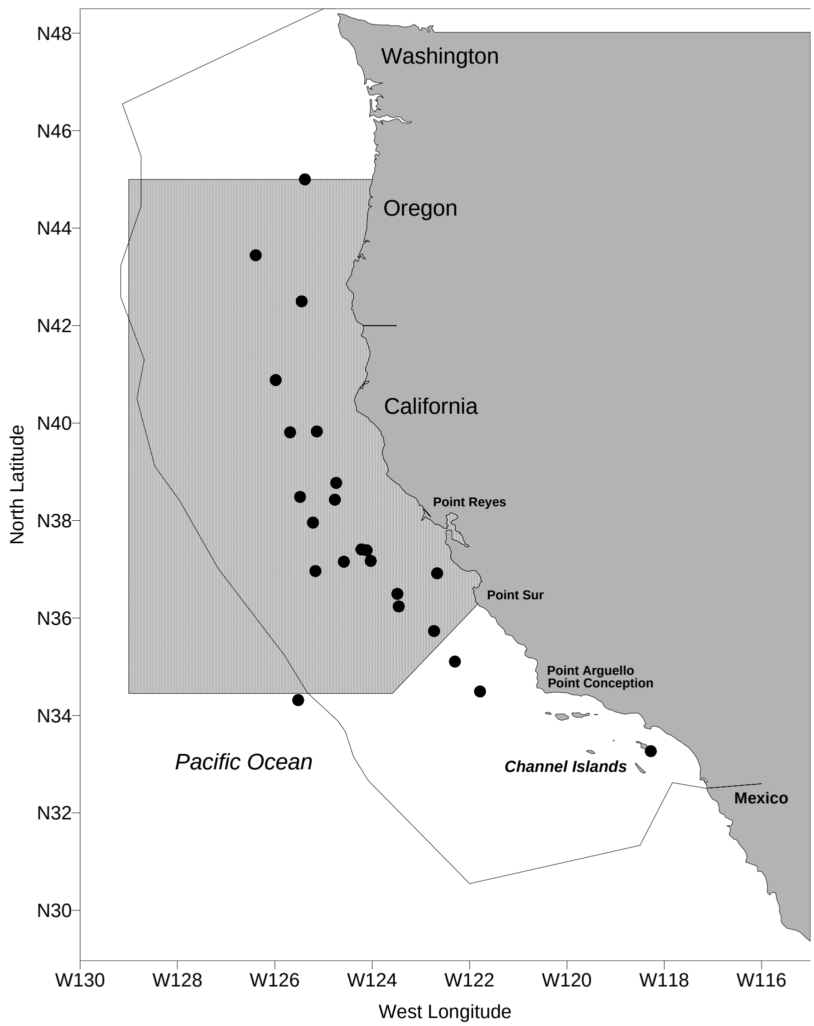

Figure 1. Location of observed leatherback sea turtle takes (n = 23) in the large-mesh drift gillnet fishery for swordfish and thresher shark, 1990 – 2004. The shaded region represents the area closure implemented in 2001 to protect leatherback sea turtles.

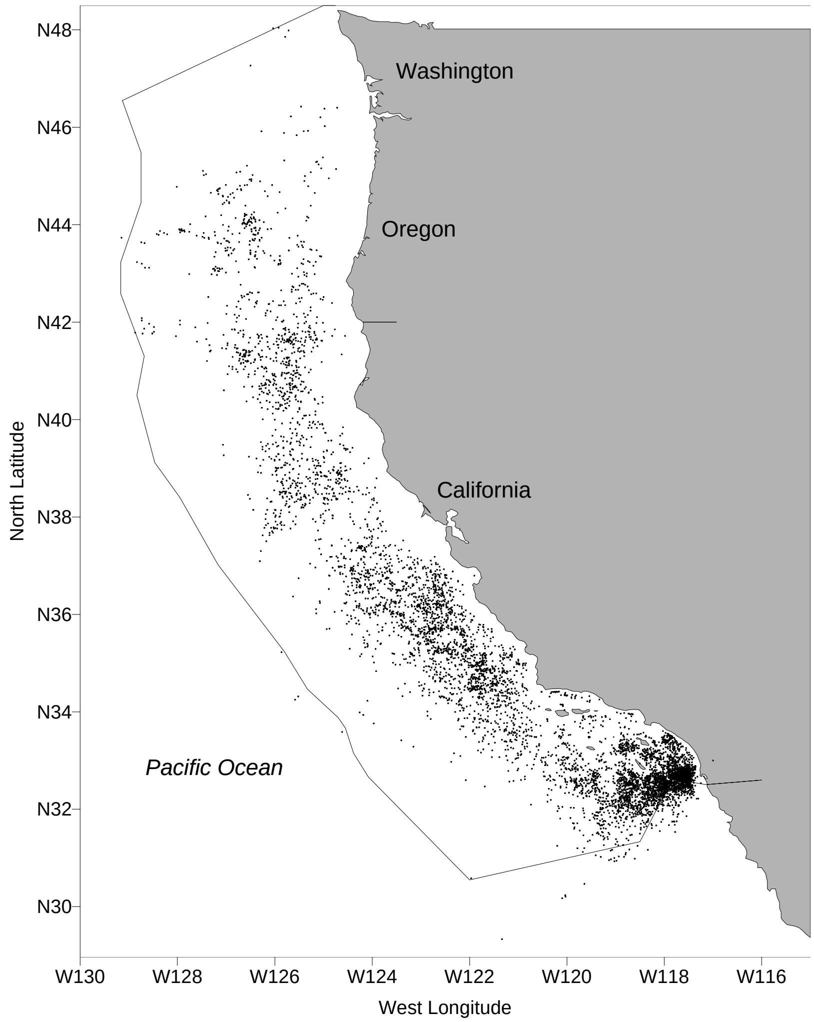

Figure 2. Locations of all observed sets (n = 6,961) in the large-mesh swordfish and thresher shark drift gillnet fishery, 1990 – January 2004.

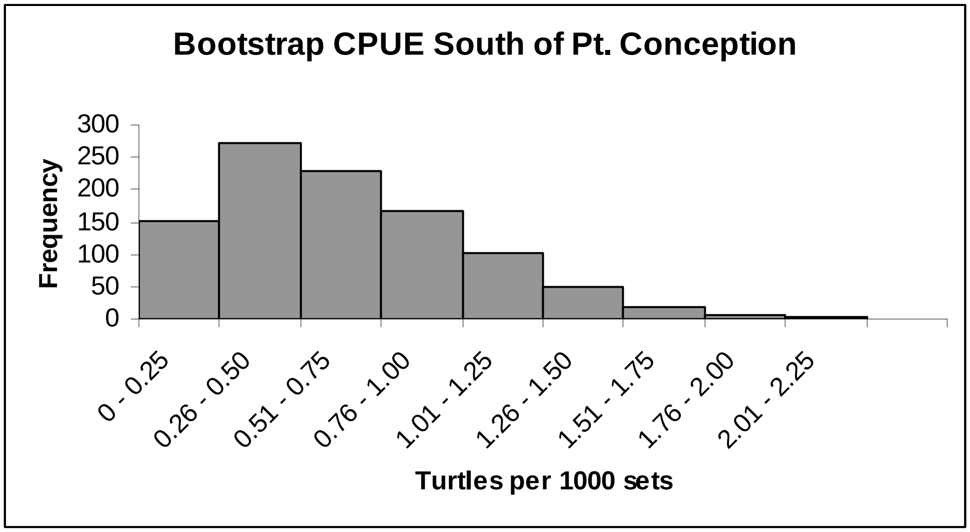

Figure 3. Distribution of bootstrap-derived leatherback CPUE values for the area south of Point Conception, California.

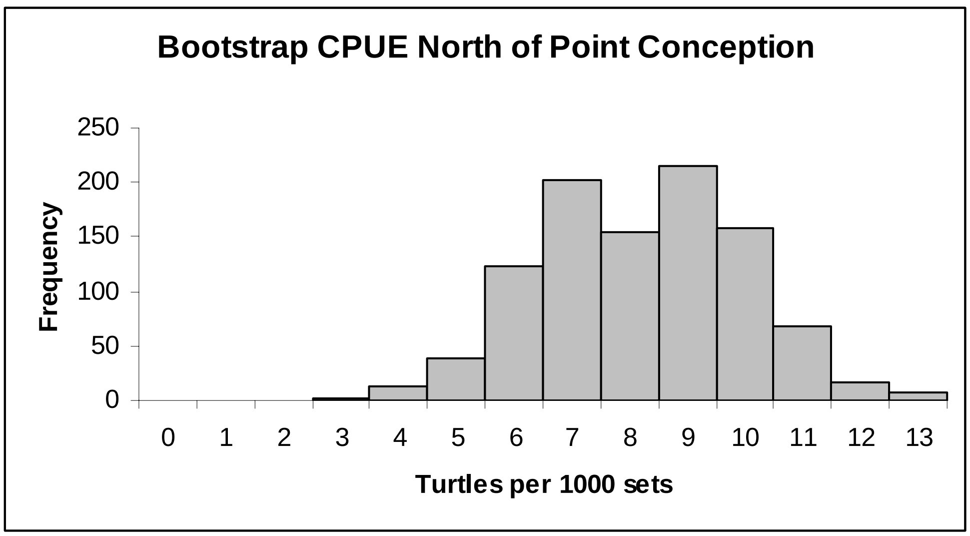

Figure 4. Distribution of bootstrap-derived leatherback CPUE values for the area north of Point Conception, California.

HMS FMP
2005 SAFE Report
Revised Outline

1. Introduction (Kit Dahl)

2. Description of the Fisheries (Michele Culver, Steve Crooke and Steve Wertz, and Jean McCrae, compiled by Steve Crooke)
   - 2.1 Washington (Commercial and Recreational)
   - 2.2 Oregon (Commercial and Recreational)
   - 2.3 California (Commercial and Recreational)

3. Regulations Currently in Place (Liz Petras and Craig Heberer)
   - 3.1 International
   - 3.2 Domestic

4. Statistical Summaries of Catch, Revenue and Effort (Dale Squires, et al.)
   - 4.1 Information and Sources
   - 4.2 Tables and Figures

Item	Description	Display
1	Pacific coast commercial HMS landings, revenues, and average prices by species, 2003-2004	Table
2	Pacific coast commercial HMS landings, revenues, and average prices by fishery, 2003-2004	Table
3	Pacific coast commercial HMS landings and revenues by species, 1981-2004 (Include 3 tables: landings, real revenues, and nominal revenues. Plot only HMS sum totals.)	Line figure
4	Pacific coast commercial landings of albacore, other tunas, swordfish, and sharks, 1981-2004	Histogram
5	Pacific coast commercial revenues for albacore, other tunas, swordfish, and sharks, 1981-2004	Line figure
6	Pacific coast commercial HMS landings by fishery, 1981-2004	Histogram
7	Pacific coast commercial HMS revenues by fishery, 1981-2004	Histogram
8	Pacific coast commercial tuna landings by fishery, 1981-2004	Histogram
9	Pacific coast commercial tuna revenues by fishery, 1981-2004	Histogram
10	Species composition of the commercial tuna landings, 1981-2004	Histogram
11	Species composition of the commercial tuna revenues, 1981-2004	Histogram
12	Pacific coast commercial swordfish landings by fishery, 1981-2004	Histogram
13	Pacific coast commercial swordfish revenues by fishery, 1981-2004	Histogram
14	Species composition of the commercial shark landings, 1981-2004	Histogram
15	Species composition of the commercial shark revenues, 1981-2004	Histogram
16	Number of commercial vessels by fishery, 1981-2004	Line figure
17	Number of commercial landings by fishery, 1981-2004 (if possible for this SAFE; otherwise include in next SAFE)	Line figure
18	Recreational Private Sport Fishing Fleet	
a.	Average weight of swordfish weighed in at the Tuna Club, Balboa Club, and San Diego Marlin Club, 1909-2002	Line figure
b.	Southern California Marlin Catch/Release	Line figure
c.	Catch rates for striped marlin in Southern California, Baja California, and Hawaii, 1970-2003	Line figure
d.	Catch/Landings (no. of fish/mt) by species, 1981-2004	Line figure
e.	Average weight of striped marlin weighed in at selected Southern California Angling Clubs, 1903-2001	Line figure

Item	Description	Display
By State		
	Albacore Surface Hook-and-Line Fishery by Area	
19	Washington	
a.	Number of vessels, 1981-2004	Line figure
b.	Number of landings, 1981-2004	Line figure
c.	Landings (mt), 1981-2004	Line figure
d.	Revenues, 1981-2004	Line figure
20	Oregon	
a.	Number of vessels, 1981-2004	Line figure
b.	Number of landings, 1981-2004	Line figure
c.	Landings (mt), 1981-2004	Line figure
d.	Revenues, 1981-2004	Line figure
21	California	
a.	Number of vessels, 1981-2004	Line figure
b.	Number of landings, 1981-2004	Line figure
c.	Landings (mt), 1981-2004	Line figure
d.	Revenues, 1981-2004	Line figure
	Recreational: Charter/Party Boat	
22	California	
a.	Albacore hours	Line figure
b.	Number of vessels targeting HMS in California waters, 1981-2004	Line figure
c.	Number of angler-hours, 1981-2004	Line figure
d.	Number of fish by species, 1981-2004	Histogram / Line figure
23	Pacific coast HMS landings by species as a share of Pacific-wide landings, 1999-2003	

5. Status of Stocks (Suzanne Kohin)
    - 5.1 Introduction, including current assessment and management procedures and control rules
    - 5.2 Review processes (assessment reliability)
    - 5.3 Recent assessment table
    - 5.4 By Species Status
        - 5.4.1 Albacore
        - 5.4.2 Yellowfin
        - 5.4.3 Skipjack
        - 5.4.4 Bigeye
        - 5.4.5 Bluefin
        - 5.4.6 Swordfish
        - 5.4.7 Striped Marlin
        - 5.4.8 Common thresher
        - 5.4.9 Bigeye thresher
        - 5.4.10 Pelagic thresher
        - 5.4.11 Shortfin mako
        - 5.4.12 Blue shark
        - 5.4.13 Dorado

6. Research and Data Needs, and Monitoring Reports (Michelle Culver)
    - 6.1 Observer Coverage
    - 6.2 Evaluation of Protected Species Interactions (Turtles, Cetaceans, and others)

Hoh Indian Tribe
2464 Lower Hoh Rd.
Forks, WA 98331

Makah Tribe
PO Box 115
Neah Bay, WA 98357

Quileute Tribe
PO Box 279
La Push, WA 98350

Quinault Indian Nation
PO Box 189
Taholah, WA 98587

June 20, 2005

Mr. Daniel J. Basta, Director
National Marine Sanctuary Program
National Oceanic and Atmospheric Administration
Office of Ocean and Coastal Resource Management
Silver Spring, MD 20910

RECEIVED
JUN 27 2005
PFMC

Dear Mr. Basta:

Thank you for meeting with us in February of this year to discuss our concerns regarding the Olympic Coast National Marine Sanctuary (OCNMS). We appreciated the opportunity to meet with you directly and were encouraged by your recognition of the importance of involving tribal governments in the development and implementation of the management plan for the OCNMS. Strengthening the government–to-government relationship with the staff and the national program remains our objective and, it is comforting to know, one of your highest priorities.

As we discussed, we are convinced that the organizational structure for the OCNMS should be built on a foundation of participatory involvement of governments with primary regulatory authority over the biological resources and activities occurring within its boundaries. We propose that a Policy Council be formally established for the OCNMS. The Council would be comprised of representatives from the Coastal Treaty Tribes, NMFS, USFWS, the PFMC, and the State of Washington (e.g. WDFW) to provide a meaningful opportunity for all the affected management entities in the region to be a part of, and guide, the direction of the OCNMS.

The Policy Council would facilitate dialog and better coordination of efforts and activities regarding resource management issues by providing a forum where unified priorities can be established and collaborative efforts undertaken both for the involved management entities and the OCNMS. The Council would serve as the principal forum for the respective entities to expedite the reconciliation of policy perspectives and facilitate the exchange of information and technical advice. The Council's functions would include the development and implementation of a management plan for the OCNMS, reviewing on-going activities, integrating regional research, public education, and conservation programs, and providing guidance to the OCNMS manager and staff.

We believe formation of a Policy Council is essential for the Department of Commerce to fulfill its trust responsibilities to the Coastal Treaty Tribes. The Tribes have a treaty rights to use and manage the harvest of resources that are within the OCNMS. (*U.S. v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974); *Washington v. Washington State Commercial Passenger Fishing Vessel Assn*, 443 U.S. 658, (1979); *U.S. v. Washington* 157 F.3d 630 (9th Cir. 1998) The Department has a fiduciary obligation to honor and protect those rights. *Seminole Nation* v. *United States,* 316 U.S. 286, 296 (1942). In addition, the Department also has the procedural duty to consult with us on matters affecting our treaty rights. Executive Order 13175 Consultation and Coordination with Indian Tribes, American Indian and Alaska Native Policy of the U.S. Department of Commerce, dated March 30, 1995.

The involvement of local resource managers to provide policy guidance for marine sanctuaries is not without precedent. Florida's legal authority and management role in Sanctuary waters is recognized in the organizational structure for the Florida Keys National Marine Sanctuary.

We agree with your suggestion that one method for increasing tribal participation is through funding support. To be successful, this funding support should extend beyond the current management plan review process. The initial allocation of twenty-five thousand dollars per tribe will assist work associated with management plan development, but this funding level would need to be increased and stabilized with the transition to plan implementation. Attachment 1 is an example of a work plan to illustrate the anticipated level of future policy and technical involvement of the Coastal Treaty Tribes with NMSP and OCNMS. This work plan will be further developed by each individual Coastal Treaty Tribe.

We look forward to working with you and your staff to develop the details for formation of a Policy Council for the OCNMS. Thank you again for your personal attention to improving the communication and interaction between the national program, OCNMS staff, and the coastal treaty tribes. We are confident that with our joint efforts that we can develop strong and meaningful working partnerships.

Sincerely,

Mary K. Leitka

Mary Leitka,
Chair
Hoh Indian Tribe

Ben Johnson Jr.

Ben Johnson, Jr.,
Chair
Makah Tribe

Russell Woodruff

Russell Woodruff,
Chair
Quileute Tribe

for

Pearl Capoeman-Baller,
Chair
Quinault Indian Nation

cc w/ att.:
Robert Lohn, NMFS
David Allan, USFWS
Don Hansen, PFMC
Rick Cook, BIA
Billy Frank, NWIFC
Carol Bernthal, OCNMS

Attachment 1: Work Plan Template Coastal Treaty Tribes

Program Summary:
This project is proposed as the first phase in the development of a collaborative program between the (TRIBE NAME) and National Marine Sanctuary Program (NMSP) for the purpose of strengthening government -to- government relationship as well as creating an organizational structure for the Olympic Coast National Marine Sanctuary (OCNMS) which provides meaningful opportunity for all affected resource management entities to guide and provide policy direction.

Key Work Plan Objectives for FY 05/06:

1) Collaboratively develop long-term strategies and processes for government –to- government relationship between the NMSP and (TRIBE NAME).
2) Develop a Policy Council as a means for integrating existing authorities to govern the management of the OCNMS.
3) Develop scientifically based planning strategies, processes and action plans for OCNMS programs to improve understanding of local coastal ecological processes and guide the development of recommendations for potential actions to protect or enhance the resources that depend on them.
4) Provide a prioritized list of information needed to fill the gaps in existing knowledge.

Policy Work plan Components:
The majority of the Policy tasks will be performed by a Tribal Council designee, with the possibility of a few tasks (such National Program issues) being performed by a member of Tribal Council.
Estimated Work Years: __ FTE Timeline: 07/01/05 -07/01/06 Amount: $

1) Establish a clear government to government process consistent with the trust responsibility of the United States to the (TRIBE NAME) Indian Tribe and the principles articulated in the Secretarial Order on American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, National Marine Sanctuaries Act, the Endangered Species Act, treaties, statutes, executive orders, and judicial decisions.

    a) Provide for (TRIBE NAME) representation on a Policy Council to include management and planning authorities around and within the OCNMS (Coastal Treaty Tribes, NMFS, USFWS, PFMC, and Washington State (e.g. WDFW)); Preliminary work will include a legal analysis and development of specific MOA (Enforcement, Artifacts etc.) between National Marine Sanctuary Program and (TRIBE NAME):
    :
    b) Work jointly with OCNMS to develop a protocol for coordination of procedures, roles, and responsibilities of the (TRIBE NAME) and the National Marine Sanctuary Program regarding planning processes associated with the management, conservation and scientific study of the marine resources within the Olympic National Marine Sanctuary:

c) Provide the (TRIBE NAME) the opportunity to consult as equal partners with Regional and National Sanctuary Program forums:

d) Work with OCNMS staff to develop a Communication and education strategy for Olympic Coastal communities:

Technical Workplan Components (Under NMSP/OCNMS funding support):
The technical tasks will be performed by tribal technical staff.
Estimated Work Years:__ FTE Timeline: 07/01/05 -07/01/06 Amount: $

1) The (TRIBE NAME) technical staff will function to provide assistance to the Tribal representative to the Policy Council and participate in the development of Sanctuary documents.
2) Collaboratively develop with OCNMS, science based research priorities.
3) Assist in the development of a comprehensive OCNMS permit review process which includes all resource managers.
4) In partnership with OCNMS staff, coordinate a "Annual Washington Coast Research Workshop" with Primary Investigators conducting research in and around OCNMS
5) Provide the Tribal representative to the Policy Council with technical assistance in the review and development of long term programs and short term projects for resource conservation strategies that are consistent with the OCNMS Management Plan:

REPORT ON THE 2005 PACIFIC HALIBUT FISHERIES IN AREA 2A

The 2005 Area 2A total allowable catch (TAC) of 1,330,000 lb set by the International Pacific Halibut Commission (IPHC) was allocated as sub-TACs as follows:

Tribal Fisheries	490,500 lb (35.0% + 25,000 lb)
Non-Tribal Total	839,500 lb (65.0% - 25,000 lb)
Non-Tribal Commercial	336,122 lb (includes incidental sablefish)
Washington Sport	237,257 lb
Oregon/California Sport	266,122 lb

The structure of each fishery and the resulting harvests are described below.

NON-TRIBAL COMMERCIAL FISHERIES

A sub-TAC of 266,122 lb (31.7% of the non-tribal share) was allocated to two fishery components: 1) a directed longline fishery targeting on halibut south of Point Chehalis, WA; and 2) an incidental catch fishery during the salmon troll fisheries off Washington, Oregon, and California. An additional 70,000 lb was allocated to an incidental catch fishery for limited entry, sablefish-endorsed vessels operating with longline gear north of Pt. Chehalis, WA. This allowance for the tiered sablefish fishery is only available in years when the overall Area 2A TAC exceeds 900,000 lb.

Incidental halibut catch in the salmon troll fishery A quota of 39,918 lb (15% of the non-tribal commercial fishery allocation) was allocated to the salmon troll fishery in Area 2A as an incidental catch during chinook fisheries. According to the Catch Sharing Plan, the primary management objective for this fishery is to harvest the troll quota as an incidental catch during the May/June salmon troll fishery. If any of the allocation for this fishery remains after June 30, the fishery may continue to retain incidentally caught halibut in the July through September salmon troll fisheries until the quota is taken, or until the overall non-tribal commercial catch limit is taken. The final catch ratio established preseason by the Council at the April meeting was one halibut (minimum 32") per three chinook landed by a salmon troller, except that one halibut could be landed without meeting the ratio requirement, and no more than 35 halibut could be landed per trip.

- Halibut retention was permitted in the salmon troll fisheries from May 1 through August 7, 2005. Of the halibut taken in the salmon troll fisheries, 9,759 lb were landed in Oregon and 32,351 lb were landed in Washington for a total of 42,110 lb (5.4% over quota.)

<u>Directed fishery targeting on halibut</u> A quota of 226,203 lb (85% of the non-tribal commercial fishery allocation) was allocated to the directed longline fishery targeting on halibut in southern Washington, Oregon, and California. The fishery was confined to the area south of Subarea 2A-1 (south of Point Chehalis, WA; 46° 53'18" N. lat.). One-day fishing periods of 10 hours in duration were scheduled by the IPHC for June 29, July 13, July 27, August 10, August 24, September 14, and September 28. A 32" minimum size limit was in effect for all openings. Vessel landing limits per fishing period based on vessel length were imposed by IPHC during all openings as shown in the following table. Vessels choosing to operate in this fishery could not land halibut in the incidental catch salmon troll fishery, nor operate in the recreational fishery.

Fishing period limits (dressed weight, head-off in pounds) by vessel size.

Vessel Class/Size	6/29/05 Opening	7/13/05 Opening	7/27/05 Opening	8/10/05 Opening
A 0 - 25 ft.	755 lb	755 lb	670 lb	325 lb
B 26 - 30 ft.	945 lb	945 lb	840 lb	420 lb
C 31 - 35 ft.	1,510 lb	1,510 lb	1,345 lb	670 lb
D 36 - 40 ft.	4,165 lb	4,165 lb	3,705 lb	1,850 lb
E 41 - 45 ft.	4,480 lb	4,480 lb	3,985 lb	1,990 lb
F 46 - 50 ft.	5,365 lb	5,365 lb	4,770 lb	2,385 lb
G 51 - 55 ft.	5,9855 lb	5,9855 lb	5,320 lb	2,660 lb
H 56+ ft.	9,000 lb	9,000 lb	8,000 lb	4,000 lb

- The June 29 directed commercial fishery resulted in a catch of about 90,000 lb, leaving 136,203 lb for later openings.

- The July 13 directed commercial fishery resulted in a catch of about 68,000 lb, leaving 68,203 lb for later openings.

- The July 27 directed commercial fishery resulted in a catch of about 38,000 lb, leaving 30,203 lb for later openings.

- The August 10 directed commercial fishery resulted in a catch of about 40,000 lb, exceeding the quota by 9,797 lb.

Incidental halibut catch in the primary sablefish longline fishery north of Point Chehalis A quota of 70,000 lb was allocated to the limited entry primary sablefish fishery in Area 2A as an incidental catch during longline sablefish operations north of Point Chehalis, WA. The primary sablefish season began on April 1, 2005, and closes October 31, 2005, although incidental halibut retention was not available until May 1. Properly licensed vessels could retain up to 100 lb of dressed weight (headed-and gutted) halibut per 1,000 lb of dressed weight sablefish, plus up to two additional halibut per fishing trip. Each vessel was allowed to retain up to a total cumulative limit of halibut that was based on the amount of primary season sablefish available to that vessel when the vessel applied for a 2005 IPHC license. Incidental halibut landings in the primary sablefish fishery through August 25, 2005 were 38,738 lb.

SPORT FISHERIES (Non-Tribal).
A sub-TAC of 503,379 lb (68.3% of non-tribal share) was allocated between sport fisheries in the Washington area (48.5%) and Oregon/California (51.5%). The allocations were further subdivided as quotas among seven geographic subareas as described below.

Washington Inside Waters Subarea (Puget Sound and Straits of Juan de Fuca). This area was allocated 64,800 lb (27.2% of the Washington sport allocation). Due to inability to monitor the catch in this area inseason, a fixed season was established preseason based on projected catch per day and number of days to achieve the sub-quota. The Eastern Region (East of Low Point) opened on April 14 and continued through June 20, 5 days per week (closed Tuesday and Wednesday). The Western Region opened on May 26 and continued through July 31, 5 days per week. The daily bag limit was one halibut of any size per person. Landings data from this fishery are not yet available.

Northern Washington Coastal Waters Subarea (landings in Neah Bay and La Push). The coastal area off Cape Flattery to Queets River was allocated 115,437 lb (49.0% of the Washington sport allocation). The fishery was divided into two seasons with 32,322 lb set aside for the second season. The fishery was to open May 10 and continue 5 days per week (closed Sunday and Monday) until 83,115 lb were estimated to have been taken. The second season was to open in the week of June 16 and continue 5 days per week (closed Sunday and Monday) until the entire quota for this subarea was estimated to be taken. The Yelloweye Rockfish Conservation Area is located within this subarea, southwest of Cape Flattery, and was closed to halibut fishing. The daily bag limit was one halibut of any size per person.

- The fishery opened May 10 and continued 5 days a week, until May 18, when 76,967 lb were estimated to have been taken. The remaining quota for the May season, 6,148 lb, was not enough to continue the 5 day per week fishery; this remaining quota was transferred to the June season.

$ The season re-opened on Thursday June 16th and Saturday June 18th, during which 31,182 lb were taken, for a season total of 108,149 lb, leaving approximately 7,288 lb in the subarea quota.

Washington South Coast Subarea (landings in Westport). The area from the Queets River to Leadbetter Point was allocated 50,146 lb (21% of the Washington sport allocation). The fishery was to open on May 1 and continue 5 days per week (closed Friday and Saturday) offshore, until the quota was taken. An inshore fishery was also to open May 1 and continue 7 days per week in waters between the Queets River and 47° 00'00" N. lat., and east of 124°40'00" W. long. through the closure of the offshore fishery until either the subarea quota were estimated to have been taken, or until September 30, whichever occurred first. The daily bag limit was one halibut of any size per person.

- The 5 day per week offshore fishery and the 7 day per week inshore fishery opened on May 1st and remained open until May 30th. The total catch for this subarea was 54,549 lb, exceeding the quota by 4,403 lb (8.8% overage.)
- NMFS, WDFW, and IPHC met to discuss an inseason transfer of quota between Washington's coastal sub-areas. It was decided that a portion of the remaining Washington recreational quota (from the north coast) could be used to accommodate incidental catches of halibut in the northern nearshore area of the south coast on Fridays and Saturdays, when bottomfish fishing is open, and salmon is closed. This action was taken inseason, effective July 15.
- Effective August 5, WDFW took inseason action to close its sport bottomfish and halibut fisheries seaward of 30 fm to reduce the bycatch rate of canary rockfish. As such, the northern nearshore area in the south coast was also closed seaward of a line approximating the 30-fm depth contour.
- Through August 21, there have been 955 lb of halibut landed, which were caught in the northern nearshore area; this fishery will remain open until the remaining quota is taken, or September 30, whichever comes first.

Columbia River Subarea (Leadbetter Point to Cape Falcon). This sport fishery subarea was allocated 13,747 lb, consisting of 2.7% of the Washington sport allocation plus an equivalent weight of halibut from the Oregon/California sport allocation. The fishery was to open May 1 and continue 7 days per week until September 30 or until the quota has been taken. The daily bag limit was one halibut of any size per person.

- This 7 day per week fishery began on May 1st and closed on June 12th with a total catch of 14,521 lb (5.6% over quota).

Oregon Central Coast Subarea (Cape Falcon to Humbug Mountain). This sport fishery subarea was allocated 251,264 lb (95% of the Oregon/California sport allocation less the amount needed to set Oregon's contribution to the Columbia River Area equal to Washington's contribution, by weight).

Three seasons were set for this subarea: 1) a restricted depth (inside 40 fathoms) fishery to commence on May 1 and continue every day until the nearshore sub-quota of 20,101 lb were estimated to have been taken; 2) a fixed Spring season in all depths that was to open on May 12-14, 19-21, and 27-29, and June 2-4, and 9-11 with a catch allocation of 173,372 lb, and; 3) a Summer season in all depths that began on August 5-7 and which was to continue on as many weekends as possible until the total Spring-Summer quotas of 231,163 lb have been taken or until October 31, whichever is earlier. The daily bag limit was one halibut of any size per person.

- The inside 40-fathom fishery opened on May 1 and is scheduled to close October 31. As of August 7th, 4,701 lb of halibut had been taken in the inside 40-fathom fishery.

- The first fixed all-depth season in May-June, held May 12-14, 19-21, and 27-29, and June 2-4, and 9-11, had a total catch of 132,605 lb, which left enough halibut in the quota to allow openings on June 30-July 2, July 14-16, and July 28-30. During these nine additional all-depth fishery days, an additional 32,393 lb were taken, leaving 8,374 lb in the Spring quota. This remaining poundage was made available to the Summer all-depth fishery.

- The initial Summer all-depth season quota of 57,791 lb was supplemented by the 8,374 lb remaining from the Spring fishery. As a result of this additional poundage, 66,165 lb was initially available to the Summer all-depth fishery. The Summer all-depth fishery opened on August 5-7 (Friday-Sunday). Following that opening's catch of 8,791 lb, NMFS, ODFW, and IPHC conferred inseason and took action to provide more fishing opportunity in this sub-area. The agencies agreed to transfer 10,000 lb from the nearshore fishery's quota, leaving 67,374 lb for the remainder of the all-depth Summer season. Beginning August 12th, the fishery has been open every Friday-Sunday with a one-fish bag limit. Through August 21st, the fishery had taken 28,240 lb, leaving 47,925 lb for the remainder of the season.

South of Humbug Mountain, Oregon and off the California Coast Subarea This sport fishery was allocated 7,984 lb (3.0% of the Oregon/California quota). This area had a pre-set season of 7 days per week from May 1 to October 31. The daily bag limit was one halibut of any size per person.

- This season is scheduled to remain open through September 30. No catch estimates are available for this fishery, but it is unlikely that this subarea quota will be taken.

TRIBAL FISHERIES

A sub-TAC of 490,500 lb (35% + 25,000 lb of the Area 2A TAC) was allocated to tribal fisheries. The treaty tribes estimated that 38,000 lb would be used for ceremonial and subsistence (C&S) fisheries and the remaining 452,500 lb was allocated to the commercial fishery. The 2005 management plan was essentially identical to the new management plan that the treaty tribes had agreed to for their 2004 fisheries. This plan divides the fisheries into Aseparately managed@ fisheries and “joint restricted” fisheries.

For the separately managed fisheries, a tribe or group of tribes was allocated a certain percentage of the TAC that could be harvested any time between noon on February 27 and noon on July 30. Collectively, the separately managed fisheries accounted for 75% of the tribal commercial TAC. The separately managed fisheries landed 343,238 lbs in 462 landings (out of 339,375 lbs expected).

The remaining 25% of the TAC was open to all parties in the “joint restricted” fishery that was managed to last at least 40 days. The joint restricted fishery opened at noon March 21 with a 500-lb/vessel/day limit. Due to lower than expected effort, the fishery was extended after the scheduled closure on April 30th at noon. The first extension was from noon May 4th to midnight May 24th. A second extension to harvest the remaining available poundage lasted from noon May 31st to noon June 6th. The joint restricted fishery landed 109,474 lb in 434 landings (out of 113,125 lb expected). The total commercial catch in 2005 was 452,712 lb – an overage of 212 lb for the Tribal Commercial TAC.

Fishery	Dates Held	Pounds Landed	# of Landings
Separately Managed	February 27 - July 30	343,238 lb	462 landings
Restricted, 250-500 lb/vessel/day	March 21 – June 6	109,474 lb	434 landings
Total		452,712 lb	89 landings

The C&S fishery will continue through December 31 and tribal estimates of catch will be reported by the tribes in January 2006.

2005 Area 2A TAC and Catch (in pounds)

	Quota		Inseason Revised Quota		Catch		Over/Under
TRIBAL FISHERIES	490,500				490,712	✻	0.04%
Commercial	452,500				452,712		0.05%
Ceremonial & Subsistence	38,000				38,000	✻	
NON-TRIBAL FISHERIES	839,500						
COMMERCIAL	336,121						
Troll	39,918				42,110		5.4%
Directed	226,203				236,000		4.3%
Sablefish Incidental	70,000						
SPORT	503,379						
WA Sport	237,257						
OR/CA Sport	266,122						
WA Inside Waters	64,800						
WA North Coast	115,437				108,149		-6.3%
WA South Coast	50,146		57,034	♦			
Col River Area	13,747		14,147	♦	14,521		2.7%
OR Central Coast	251,264						
Inside 40 fathoms	20,101		10,101	★			
Spring (May-July)	173,372				164,999		-4.8%
Summer (August-October)	57,791		76,164	★			
OR S. of Humbug/CA	7,984						
TOTAL	1,330,000						

✻ Assumed. Estimate of amount of halibut taken in ceremonial and subsistence fisheries is not available until after December 31.

♦ Washington's North Coast subarea closed with 7,288 lb remaining in its quota. Of that amount, 400 lb were transferred to the Columbia River area to cover the Washington portion of that subarea's overage. The remaining 6,888 lb were transferred to the South Coast subarea to cover a 4,403 lb overage from that subarea's all depth fishery and to allow the nearshore area fishery to continue through the remainder of the fishing season.

★ Oregon's Central Coast spring all-depth fishery underage of 8,373 lb, plus 10,000 lb from the inside 40-fm fishery were transferred to the summer all-depth fishery, increasing that quota to 76,164 lb.

State of California – The Resources Agency ARNOLD SCHWARZENEGGER, Governor
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
1933 Cliff Drive, Suite 9
Santa Barbara, CA 93940
805.568.1235

August 31, 2005

Dr. Donald O. McIsaac, Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

Re: 2004 Exempted Fishing Permit Report for Selective Flatfish Trawl Study

Dear Dr. McIsaac:

Enclosed for the September briefing book is a copy of our final 2004 Exempted Fishing Permit (EFP) report. The report summarizes our study to test a selective flatfish trawl designed by the Oregon Department of Fish and Wildlife, and a modified Scottish seine to catch shelf flatfish while avoiding rockfish in the coastal waters of central California, south of 40° 10' N latitude. The report also provides recommendations concerning use of these gears which the Council may want to consider.

If you have any questions about the attached EFP report, please contact Mr. Steve Wertz, Associate Biologist in the Department's Marine Region, by telephone at 562.342.7184 or by email at swertz@dfg.ca.gov.

Sincerely,

Marija Vojkovich

Marija Vojkovich
Offshore Ecosystem Coordinator

Enclosure(s)

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2004

California Department of Fish and Game

Exempted Fishing Permit Study

Prepared By
Marine Region
California Department of Fish and Game
September 7, 2005

Summary

The California Department of Fish and Game (CDFG) conducted an Exempted Fishing Permit (EFP) study during 2004 to observe and collect data on the rate at which unintended species, particularly overfished rockfish, are taken by commercial trawl fishermen targeting shelf flatfish (Table 3) in all depths of federal waters adjacent to California south of 40° 10’ N latitude. Two gear types were used during this EFP study: an experimental selective flatfish trawl net designed by the Oregon Department of Fish and Wildlife (ODFW), and a modified Scottish seine. The trawl net designed by ODFW is more selective in the harvest of shelf flatfish species while excluding rockfish species than trawl net configurations currently used in the fishery. Two vessels participated, with 100% observer coverage from October 18 to December 29, 2004, resulting in 34 trips and 116 tows. The study results are as follows:

- The participating vessels caught 237,043 lbs of groundfish;
- The targeted flatfish species accounted for 80% by weight of the retained catch and 65% by weight of the total groundfish catch;
- Weights of overfished rockfish were: canary (7 lbs), darkblotched (8 lbs), cowcod (132 lbs), and bocaccio (5,436 lbs);
- No widow or yelloweye rockfish were observed; and
- Total bycatch rate estimates for overfished rockfish per pound target species were: canary (0.0001), darkblotched (0.0001), cowcod (0.0028), and bocaccio (0.0473).

Introduction

Shelf flatfish (Dover sole, English sole, petrale sole, and “other flatfish”: rex sole, rock sole, sanddabs spp., sand sole, starry flounder, turbot spp.) are an extremely important group of groundfish in the California seafood industry. These stocks are believed to be healthy, and California fishermen and fish processors have worked aggressively to develop strong markets for these species, especially on the central California coast. A component of California’s trawl fleet and processors are heavily dependent upon these flatfish.

On July 1, 2002, the US Secretary of Commerce closed the eastern Pacific continental shelf south of 40° 10’ N latitude to retention of shelf groundfish species, based on an inseason recommendation from the Pacific Fishery Management Council (PFMC) to protect bocaccio, canary, cowcod, darkblotched, widow, and yelloweye rockfish, which were declared overfished by the National Marine Fisheries Service (NMFS). By 2003, this became a depth-bounded area closure based on the primary depth distribution of overfished species, designated the Trawl Rockfish Conservation Area (RCA). This action precluded trawl fishing access to healthy flatfish stocks that occur on the shelf floor in the RCA.

Fishermen using small footrope trawl gear to catch shelf flatfish testified before the PFMC that they could pursue this fishery inside the Trawl RCA with minimal or no bycatch of overfished rockfish. To test this assertion, NMFS issued an EFP to CDFG in the fall of 2002 to allow for normal trawl fishing operations for shelf flatfish within the Trawl RCA to estimate the bycatch of overfished rockfish. Six vessels participated in the study. Fishing operations were conducted in Pacific Ocean waters adjacent to California to a maximum water depth of 70 fm, south of 40° 10' N latitude from port groups San Francisco to Monterey. Results from the 2002 EFP showed that the total bycatch rate of bocaccio, canary, cowcod, and widow rockfish was nominal (≤ 0.0003); no yelloweye or darkblotched rockfish was observed (CDFG 2004a).

The CDFG received an EFP in 2003, to conduct a study with up to six vessels using an experimental selective flatfish trawl, on the central California coast to a maximum water depth of 100 fm. The selective flatfish trawl was previously designed and tested by the ODFW. Their study results showed this gear was effective in minimizing the bycatch of overfished shelf rockfish north of 40° 10' N latitude to a depth of 100 fm (Parker et al. 2004). The goal of the 2003 CDFG study was to:
1) document the rate at which non-target species (particularly overfished shelf rockfish such as bocaccio, canary, cowcod, darkblotched, widow, and yelloweye) are taken by commercial fishers targeting shelf flatfish while using an experimental selective flatfish trawl developed by ODFW;
2) estimate discard and total bycatch rates for target and non-target groundfish species caught in an experimental selective flatfish trawl and modified Scottish seine;
3) collect biological data that are otherwise not available from the landed catch; and
4) document the at-sea catch data for rockfish to evaluate the full retention of rockfish in the trawl fishery as a management tool.

One vessel participated in the study, and deployed a Scottish seine modified to meet the specifications of the experimental selective flatfish trawl designed by ODFW. Since this gear was unique and not previously tested, the 2003 EFP bycatch estimates could not be expanded as representational of the small footrope trawl fleet south of 40° 10' N latitude (CDFG 2004b).

The goals of the 2004 EFP were the same as the 2003 study. The CDFG and PFMC can use the information from this study when considering management decisions about the future use of this gear south of 40° 10' N latitude.

Elements of the Study

Vessel Selection Process

The CDFG developed qualification criteria based on recent historical participation in the targeted shelf flatfish fishery in the coastal waters of central California. Vessels were required to have landed at least 10,000 pounds of shelf flatfish (Dover sole, English sole, petrale sole, and "other flatfish") taken by small footrope trawl and Scottish seine gears in at least two of six years from 1998 to 2003 in California ports, and the vessel operator was required to hold a current valid California commercial fishing license. The Code of Federal Regulations (CFR) includes Scottish seine gear within its definition of bottom trawl gear (50CFR660.302). Initially, 56 vessels were identified and the owners were contacted about participating in the study; however, 13 of the qualified vessel owners opted to participate in the federal fishing capacity reduction program of 2003, reducing the final eligibility list to 43 vessels. The CDFG received three applications of interest and two vessels were selected for the study. The selected vessels operated out of port groups San Francisco and Monterey.

Net Design

As part of the permit agreement, the participating vessel operators were required to fish a small footrope trawl as defined in the CFR (50CFR660.302), except that modifications of the net were required to meet the selective flatfish trawl specifations developed and tested by ODFW. The selective flatfish trawl net configuration requirements were:
1) two seamed net with a breastline no longer than 3 ft in length;
2) headrope to footrope ratio of at least 1.30 (i.e., 30% longer headrope);
3) no floats permitted along the middle 50% of the headrope, except for Scottish seine, for which no floats permitted along the middle 25% of the headrope;
4) center of the headrope with a rise of not more than 5 ft above the footrope;
5) a wing tip height of not more than 30 meshes; and
6) a footrope not longer than 105 ft, except for Scottish seine, with a footrope not longer than 130 ft in length.

Study Area

Fishing activity took place south of 40° 10' N latitude between port groups San Francisco and Monterey in Pacific Ocean waters adjacent to California to bottom depths accessible to small footrope trawl gear. Participants were not restricted from fishing within the Trawl RCA.

Observers

The participating vessels operators were required to carry a federal observer when fishing for shelf flatfish under the terms of the EFP. Observers were trained according to the NOAA Fisheries West Coast Groundfish Observer Program (WCGOP) (NWFSC 2004). Portside samplers, contracted by CDFG from the Pacific States Marine Fisheries Commission intercepted the EFP vessels when they returned to port to collect biological measurements from the catch including fish length, sex, maturity, and aging structures (otoliths).

Bycatch Thresholds

As part of the permit agreement with the participating vessel owners, monthly bycatch thresholds (i.e., catch caps) were established to limit fishing mortality of overfished rockfish (bocaccio, canary, cowcod, and yelloweye rockfish) and lingcod that can co-occur with the healthy shelf flatfish species. Attainment of any threshold would result in termination of fishing under the EFP. Each vessel was limited to no more than 50 pounds each of canary, cowcod, or yelloweye rockfish and no more than 1,000 pounds of bocaccio rockfish per fishing month. If either threshold was reached, the vessel was prohibited from any further EFP fishing for the remainder of the month, but could resume the following month. A cumulative bycatch threshold for lingcod was set at 44,100 pounds for the entire EFP period.

Rockfish Retention Provisions
The permit required retention of all rockfish species (*Sebastes spp.* and *Sebastolobus spp.*) caught during a trip; hence, provisions were drafted to allow retention of rockfish in excess of published trip limits in the Federal Register for the participating vessels. This requirement was expected to provide information to evaluate a future broader scale retention program for the groundfish trawl. Proceeds from the sale of rockfish landed in excess of the published trip limits were forfeited to the CDFG Preservation Fund.

Trip Limit Provisions
The participating vessels were required to stay within the routine flatfish trip limit provisions published in the Federal Register for trawl vessels deploying small footrope gear south of 40° 10' N latitude. Landing provisions allowed up to 120,000 pounds per 2-month cumulative period for shelf flatfish, no more than 20,000 pounds of which could be petrale sole during (September-October); and of which no more then 100,000 pounds may be petrale sole during (November-December). The permit required that landings be made at designated processing plants.

Analytical Methods

Catch Documentation
Three independent data sources were integrated to accurately measure total bycatch and discard rates:
1) CDFG landing receipt data entered into Pacific Fisheries Information Network (PacFIN) landing receipt database;
2) Coastwide Trawl Log database; and
3) at-sea observer data.

1. PacFIN database: used for documenting the landed catch for observed trips. Landing receipt data were assumed to be accurate due to the legal requirement to document actual weights, not estimated weights. All trawl logs were matched to landing receipts and the species weights for each tow were estimated from landing receipts. The following steps were used to estimate tow-level weights reported in the logs:

- (i) If a landed species was listed on both the trawl log and landing receipt and the summed log and receipt pounds were not equal:
  - a. Calculate the ratio between the total landing receipt pounds and the total trawl log pounds for that species;
  - b. Multiply the trawl log species pounds by the ratio for every tow that had the species to create the final landing receipt pounds for the tow.
- (ii) If a landed species was recorded on the trawl log but not on the landing receipt, receipt pounds were assumed to be zero; hail pounds were unchanged.
- (iii) If the landed species was recorded on the landing receipt but not on the trawl log, receipt pounds were added to each tow of the trip trawl logbook data base. The total pounds were divided equally between all tows within the acceptable depth range for the landed species.

2. Trawl log database: provided fishing location and effort information at the tow-level.

3. Observer database: provided for at-sea catch information and discard weight estimates.

Discard and Bycatch Analyses

Analyses for this report attempt to parallel the methodologies described in the Northwest Fisheries Science Center's WCGOP report (NWFSC 2003) for estimating discard and total bycatch rates for the west coast groundfish fleet when possible and appropriate. For this report, "groundfish" are those species found in the federal Pacific Coast Groundfish Fishery Management Plan (PCGFMP), and the designation "group" represents a market category.

PacFIN receipt, trawl log, and observer databases were merged to allow for tow-level analyses of discard and total bycatch during the EFP. Three different measurements were used to calculate ratio estimators for discard:
1) discard pounds per hour towed;
2) discard pounds per pound of retained target species; and
3) discard pounds per pound of retained groundfish.

The target species denominator consisted of all marketable shelf flatfish species retained per tow, while the groundfish denominator consisted of all federally managed groundfish retained per tow. Total bycatch estimates were also derived using the same ratio estimators; however, the denominators included retained plus discarded catch weights. These estimates were stratified by 2-month landing limit periods: September/October and November/December.

Results

Spatial and Temporal Distribution of Observations

Under the terms of the EFP, two vessels conducted normal fishing operations for shelf flatfish with 100% at-sea observer coverage over two 2-month landing limit periods from October 18 to December 29, 2004. One vessel fished a selective flatfish trawl and a second vessel fished a modified Scottish seine. Observers went on a total of 34 EFP trips, documented fishing activity and catch, and collected biological samples from 116 tows. Fishing effort occurred south of 40° 10' N latitude in the vicinity of port groups Monterey and San Francisco. The port of origin was unique for each vessel; the trawl vessel's port of origin was Monterey and the Scottish seine vessel's port of origin was San Francisco. The number of observed trips by port of origin and gear are summed by 2-month landing limit periods (Table 1).

Table 1. Number of observed at-sea trips by port of origin and gear fished per 2-month landing limit for the study period.

	Observed Trips by Port of Origin and Gear					
	September - October		November - December		Total for Permit Period	
Port /Gear	Number	Percent	Number	Percent	Number	Percent
Monterey/Trawl	4	57%	23	85%	27	79%
San Francisco/Seine	3	43%	4	15%	7	21%
Total	7		27		34	

During the EFP, trawl log data indicated fishing effort ranged in depth from 18 fm to 200 fm over the ocean bottom between Point Año Nuevo and Point Sur (Figure 1). Table 2 shows the total number of tows, tow hours, tow depths per 2-month landing limit periods for the study.

Table 2. Number of observed at-sea tows, total hours towed, and summary of tow depth profiles by gear and fishing period.

Trawl		Tow		Tow Start Depth			Tow End Depth		
Trip Period		Number	Hours	Min.	Max.	Avg.	Min.	Max.	Avg.
Sep.-Oct.		12	28	57	146	122	57	187	135
Nov.-Dec.		61	148	18	187	65	16	200	64
	Total	73	176						

Seine		Tow		Tow Start Depth			Tow End Depth		
Trip Period		Number	Hours	Min.	Max.	Avg.	Min.	Max.	Avg.
Sep.-Oct.		27	54	75	110	91	75	110	91
Nov.-Dec.		16	32	75	110	92	75	110	92
	Total	43	86						

Catch, Discard and Bycatch Estimates

A list of all the target and non-target groundfish species caught by both gears during the study is shown in Table 3. Amounts of discard, retained, and total catch for 40 groundfish species/market categories are summed for the selective flatfish trawl and modified Scottish seine gears in Tables 4 and 5, respectively. Rockfish are presented first in each table, followed by thornyheads, flatfish, roundfish, sharks, skates, and ratfish species.

Selective Flatfish Trawl

A total of 207,896 pounds of groundfish was caught from October 21 to December 29, 2004 by the trawl vessel. Eighty-one percent of the total catch was retained and 19% was discarded at-sea. The target species (shelf flatfish) comprised a majority (78%) of the retained catch weight, followed by rockfish (17%), roundfish (4%), and all other groundfish species (<1%). The total bycatch weight of overfished groundfish totaled 11,815 pounds: canary (6 lbs), darkblotched (8 lb), cowcod (130 lbs), bocaccio (5,416 lbs), and lingcod (6,255 lbs). No yelloweye or widow rockfish were caught (Tables 3 and 4). The monthly 1,000 lbs bycatch threshold for bocaccio was reached on October 28 and again on November 12, resulting in termination of EFP fishing for the remainder of each of those months. The October threshold was reached following 12 tows that ranged from 16 pounds to 133 pounds of bocaccio per tow. However, the November bycatch threshold was reached after eight tows that ranged from 6 pounds to 2,134 pounds of bocaccio per tow. The relatively high catch of 2,134 pounds occurred at a reported depth range of 169 fm to 179 fm. Overall, 74% (4,014 lbs) of the bocaccio caught during the study occurred in tows averaging more than 100 fm in depth.

Estimates of discards (by pounds per hour towed, by pound of target species, and by pound of groundfish) were calculated for 21 groundfish species/market category (Table 6). All three discard estimators showed that ratfish and skates, followed by English sole and sanddabs, had the highest discard rates in both the September/October and November/December landing limit periods. The full retention of all rockfish eliminated discard estimates for these species. One exception occurred when 14 pounds of greenstriped rockfish was discarded at-sea accidentally. The primary reasons noted for all discards were: no market demand, fish size, and prohibited species.

Estimates of total bycatch were calculated for 30 non-target groundfish species/market categories (Table 8). Overall, the estimates were variable and ranged from zero to 0.1863 for the market category group rose rockfish. Estimates for overfished groundfish ranged from a low ratio (zero to 0.0028) for canary, cowcod, and darkblotched rockfish to a higher ratio (0.0473 to 0.1025) for bocaccio and lingcod.

Modified Scottish Seine

A total of 29,147 pounds of groundfish was caught from October 18 to November 10, 2004 by the Scottish seine vessel. Eighty-seven percent of the total catch was retained and 13% was discarded at-sea. The target strategy species comprised a majority (91%) of the retained catch weight, followed by skates (5%), rockfish (3%), and roundfish (1%). The total bycatch weight of overfished groundfish totaled 182 pounds: canary (1 lb), cowcod (3 lbs), bocaccio (20 lbs), and lingcod (158 lbs) pounds. No darkblotched, yelloweye, or widow rockfish were caught (Tables 3 and 5). The Scottish seine vessel elected to not participate in the EFP after November 10 in order to focus on the Dungeness crab fishery.

Estimates of discards (by pounds per hour towed, by pound of target species, and by pound of groundfish) were calculated for 21 groundfish species/market categories (Table 7). All three estimators showed that longnose skate and ratfish had the highest discard ratios for the September/October landing limit period. In November/December management period showed that English sole, California skate, and sanddabs replaced longnose skate and ratfish as the species with the highest discard ratios in the catch.

Estimates of bycatch for 30 non-target groundfish species are shown in (Table 9). Overall, the estimates were variable and ranged from zero to 0.0734 for skates.

Estimates for overfished groundfish were nominal ranging from zero to 0.0018 for bocaccio, canary, and cowcod rockfish, and 0.0039 to 0.0071 for lingcod.

Biological Samples
More than 2,550 biological measurements and samples from 16 different species of groundfish were collected during the study by portside samplers. In addition, at-sea observers collected measurements from lingcod prior to their being released alive (Table 10). The portside data are maintained at the NMFS's Southwest Science Center, Santa Cruz Laboratory, California.

Conclusion

The 2004 EFP study provided the CDFG with its first opportunity to document discard and total bycatch for target and non-target groundfish species caught in an experimental selective flatfish trawl. Overall, the results are promising for reducing bycatch of overfished rockfish in the shelf flatfish fishery south of 40° 10' N latitude and appear similar to ODFW's (Parker et al. 2004) findings. However, due to the limited number of participants and trips in this study, caution should be exercised when comparing the findings of the two studies. Table 11 shows bycatch estimates for overfished rockfish caught in CDFG's 2004 study and those reported in ODFW's study (Parker et al. 2004). Due to the latitudinal distribution of species there is some variability in bycatch rates between the two studies. The most notable difference occurred in the bycatch of bocaccio; no bocaccio was observed in the ODFW study. The bycatch of bocaccio in the central California study was variable from tow to tow, averaging 45 lb/hr. The average pounds per hour towed was influenced by a relatively high catch of more than 2,000 pounds of bocaccio that occurred in one tow between depths of 169 fm and 179 fm of water.

Bycatch estimates of bocaccio caught in the modified Scottish seine was nominal (<1lb/hr). Unfortunately, there can be no direct comparison between this relatively passive gear when compared to traditional trawl gear for predicting bycatch of bocaccio or other overfished rockfish in the flatfish trawl fishery. However, the Scottish seine vessel has participated in each of CDFG's selective flatfish EFPs over the past three years (CDFG 2004a and 2004b), resulting in total bycatch estimates of no more then 0.0002 for any one of the nine groundfish species declared overfished by NMFS, for both the modified and unmodified versions of this gear fished to a maximum depth of 100 fm.

Management Recommendations
1) Before considering implementing regulations for use of selective flatfish trawl gear south of 40° 10' N, additional at-sea bycatch data are needed. The CDFG does not plan to continue this study in 2006 due to an overall lack of interest by industry to replace their small footrope trawl with a selective flatfish trawl. However, bycatch data collected by the WCGOP for vessels using this gear north of 40° 10' N could be used to make inferences about its potential success south of 40° 10' N.

2) In the interim, to encourage fishermen to convert their small footrope trawl gear to the selective flatfish trawl configuration designed by ODFW, an increase in the September/October and November/December trip limits for Dover sole, petrale sole, and “other flatfish” is warranted based on the bycatch rates reported in this report.
3) Scottish seine gear should be removed from the federal definition of bottom trawl gear and should have its own definition (50CFR660.302). The most unique difference between this gear and bottom trawl gear is the lack of trawl doors and no roller gear on the footrope. And, it is not actively towed across the ocean bottom. Table 12 shows the gear differences between a Scottish seine and a bottom trawl.

References

California Department of Fish and Game. 2004a. Estimates of discard and bycatch in the central California shelf flatfish fishery for small footrope trawl gear (including Scottish seine) under a federal exempted fishing permit in 2002, November (supplemental Report E.3.a), Pacific Fishery Management Council, Portland.

California Department of Fish and Game. 2004b. Estimates of discard and bycatch for modified Scottish seine gear in the central California shelf flatfish fishery for small footrope trawl gear (including Scottish seine) under a federal exempted fishing permit in 2003, November (supplemental Report E.3.b), Pacific Fishery Management Council, Portland.

Parker, S.J., Saelen, M.R., Kupillas, S.A., Hannah, R.W. 2004. Using an exempted fishing permit for a arge-scale test of a selective flatfish trawl in the continental shelf flatfish fishery. Oregon Department of Fish and Wildlife. Newport, OR, 22pp.

Northwest Fisheries Science Center (NWFSC). 2004. Northwest Fisheries Science Center West Coast Groundfish Observer Data Analyses Data Report and Summary Analyses. NWFSC, 2725 Montlake Boulevard East, Seattle, Washington, 98112.

Northwest Fisheries Science Center (NWFSC). 2004. West Coast Groundfish Observer Manual. NWFSC, 2725 Montlake Boulevard East, Seattle, Washington, 98112.

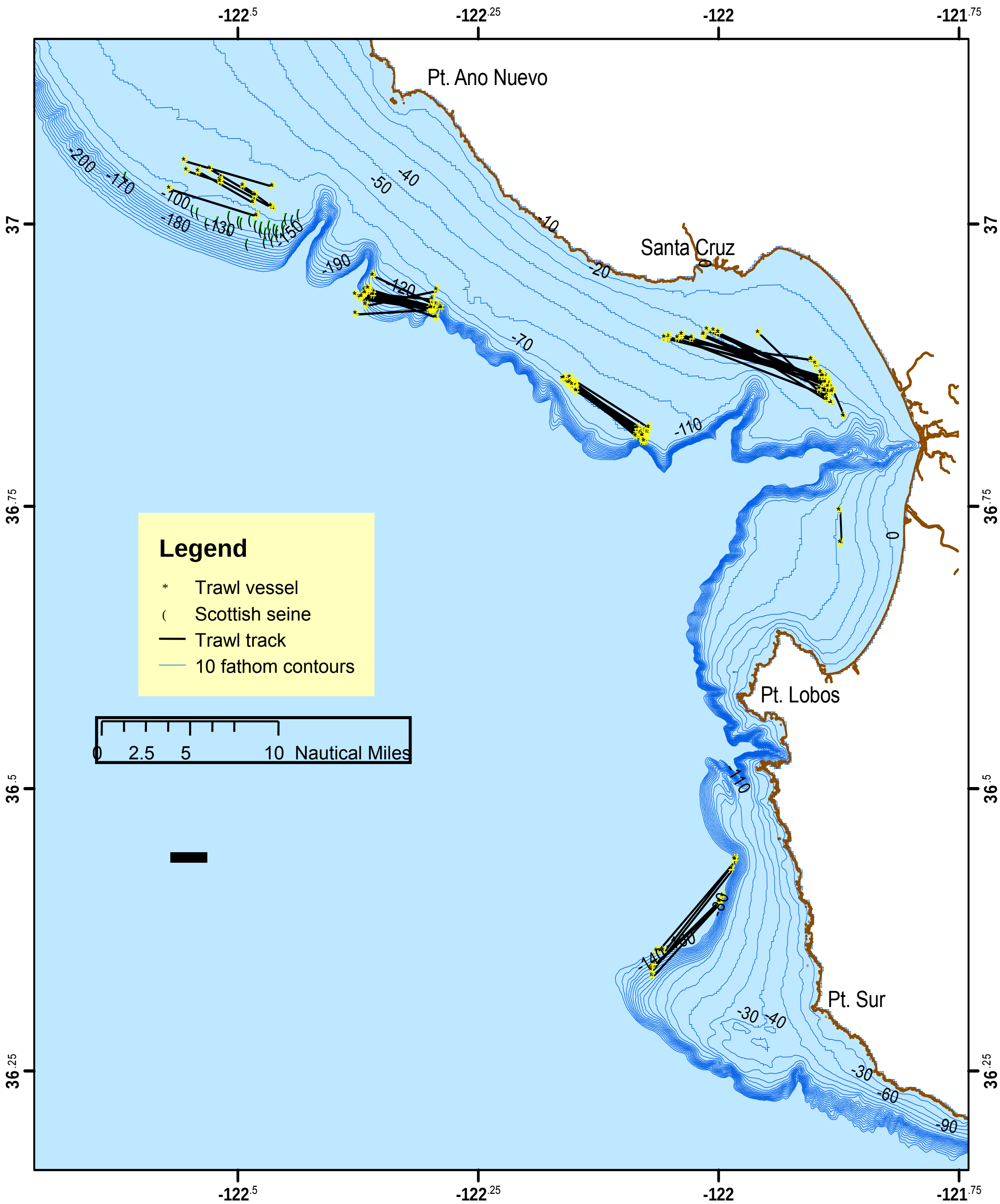

Figure 1. Tow locations for the two vessels that participated in the selective flatfish trawl study from October 18 to December 29, 2004.

Table 3. List of all 40 of the groundfish species/market category caught in the selective flatfish trawl and modified Scottish seine gears during the exempted fishing permit study from October 18 to December 29, 2004.

	Gears			**Gears**	
Target Species	**Trawl**	**Seine**	**Non-Groundfish Species**	**Trawl**	**Seine**
Flatfish			**Rockfish**		
Dover Sole	x	x	Bank Rockfish	x	
English Sole	x	x	Blackgill Rockfish	x	
Sanddab spp.	x	x	Bocaccio Rockfish	x	x
Petrale Sole	x	x	Canary Rockfish	x	x
Rock Sole	x	x	Chilipepper Rockfish	x	x
Rex Sole	x	x	Copper Rockfish	x	
Sand Sole	x	x	Cowcod Rockfish	x	x
Starry Flounder	x		Darkblotched Rockfish	x	
Curlfin Turbot	x		Flag Rockfish	x	
Turbot spp.	x	x	Greenblotched Rockfish	x	
			Greenspotted Rockfish	x	
			Greenstriped Rockfish	x	x
			Pink Rockfish	x	
			Redbanded Rockfish	x	
			Shortbelly Rockfish	x	
			Splitnose Rockfish	x	
			Striptail Rockfish	x	
			Group Rose Rockfish	x	
			Thornyheads		
			Longspine Thornyhead	x	
			Shortspine Thornyhead	x	
			Roundfish		
			Lingcod	x	x
			Sablefish	x	x
			Pacific Hake	x	x
			Sharks		
			Leopard Shark	x	
			Spiny Dogfish	x	x
			Skates and Ratfish		
			Big Skate	x	x
			California Skate	x	x
			Longnose Skate	x	x
			Skate spp.	x	x
			Ratfish	x	x

Table 4. Summary of discarded, retained, and total catch (pounds) for 40 groundfish species/market category caught in a selective trawl net during the exempted fishing permit study from October 21 to December 29, 2004.

Species	Disposition	Pounds	Percent
Rockfish			
Bank Rockfish	Discarded	0	0%
	Retained	4	100%
	Total Catch	4	
Blackgill Rockfish	Discarded	0	0%
	Retained	118	100%
	Total Catch	118	
Bocaccio Rockfish	Discarded	0	0%
	Retained	5,416	100%
	Total Catch	5,416	
Canary Rockfish	Discarded	0	0%
	Retained	6	100%
	Total Catch	6	
Chilipepper Rockfish	Discarded	0	0%
	Retained	5,654	100%
	Total Catch	5,654	
Copper Rockfish	Discarded	0	0%
	Retained	10	100%
	Total Catch	10	
Cowcod Rockfish	Discarded	0	0%
	Retained	130	100%
	Total Catch	130	
Darkblotched Rockfish	Discarded	0	0%
	Retained	8	100%
	Total Catch	8	
Flag Rockfish	Discarded	0	0%
	Retained	8	100%
	Total Catch	8	
Greenblotched Rockfish	Discarded	0	0%
	Retained	14	100%
	Total Catch	14	
Greenspotted Rockfish	Discarded	0	0%
	Retained	176	100%
	Total Catch	176	
Greenstriped Rockfish	Discarded	2	1%
	Retained	184	99%
	Total Catch	186	
Pink Rockfish	Discarded	0	0%
	Retained	6	100%
	Total Catch	6	
Redbanded Rockfish	Discarded	0	0%
	Retained	6	100%
	Total Catch	6	

Table 4. Summary of discarded, retained, and total catch (pounds) for 40 groundfish species/market category caught in a selective trawl net during the exempted fishing permit study from October 21 to December 29, 2004.

Species	Disposition	Pounds	Percent
Shortbelly Rockfish	Discarded	0	0%
	Retained	145	100%
	Total Catch	145	
Splitnose Rockfish	Discarded	0	0%
	Retained	1,350	100%
	Total Catch	1,350	
Striptail Rockfish	Discarded	0	0%
	Retained	494	100%
	Total Catch	494	
Group Rose Rockfish	Discarded	0	0%
	Retained	15,570	100%
	Total Catch	15,570	
Thornyheads			
Longspine Thornyhead	Discarded	0	0%
	Retained	16	100%
	Total Catch	16	
Shortspine Thornyhead	Discarded	0	0%
	Retained	10	100%
	Total Catch	10	
Flatfish			
Dover Sole	Discarded	98	23%
	Retained	320	77%
	Total Catch	418	
English Sole	Discarded	5,624	18%
	Retained	26,415	82%
	Total Catch	32,039	
Sanddab spp.	Discarded	4,490	8%
	Retained	52,008	92%
	Total Catch	56,498	
Petrale Sole	Discarded	28	0%
	Retained	49,024	100%
	Total Catch	49,052	
Rock Sole	Discarded	0	0%
	Retained	760	100%
	Total Catch	760	
Rex Sole	Discarded	132	24%
	Retained	412	76%
	Total Catch	544	
Sand Sole	Discarded	1	0%
	Retained	611	100%
	Total Catch	612	

Table 4. Summary of discarded, retained, and total catch (pounds) for 40 groundfish species/market category caught in a selective trawl net during the exempted fishing permit study from October 21 to December 29, 2004.

Species	Disposition	Pounds	Percent
Starry Flounder	Discarded	336	28%
	Retained	869	72%
	Total Catch	1,205	
Curlfin Turbot	Discarded	310	100%
	Retained	0	0%
	Total Catch	310	
Turbot spp.	Discarded	0	0%
	Retained	727	100%
	Total Catch	727	
Roundfish			
Lingcod	Discarded	2,443	39%
	Retained	3,812	61%
	Total Catch	6,255	
Sablefish	Discarded	49	2%
	Retained	2,414	98%
	Total Catch	2,463	
Pacific Hake	Discarded	279	100%
	Retained	0	0%
	Total Catch	279	
Sharks			
Leopard Shark	Discarded	0	0%
	Retained	100	100%
	Total Catch	100	
Spiny Dogfish	Discarded	3,113	100%
	Retained	0	0%
	Total Catch	3,113	
Skates and Ratfish			
Big Skate	Discarded	3,934	100%
	Retained	0	0%
	Total Catch	3,934	
California Skate	Discarded	1,827	100%
	Retained	0	0%
	Total Catch	1,827	
Longnose Skate	Discarded	7,619	100%
	Retained	0	0%
	Total Catch	7,619	
Skate spp.	Discarded	0	0%
	Retained	1,091	100%
	Total Catch	1,091	
Ratfish	Discarded	9,722	100%
	Retained	0	0%
	Total Catch	9,722	

Table 5. Summary of discarded, retained, and total catch (pounds) for 40 groundfish species/market category caught in a modified Scottish seine during the exempted fishing permit study from October 18 to November 10, 2004.

Species	Disposition	Pounds	Percent
Rockfish			
Bank Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Blackgill Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Bocaccio Rockfish	Discarded	0	0%
	Retained	20	100%
	Total Catch	20	
Canary Rockfish	Discarded	0	0%
	Retained	1	100%
	Total Catch	1	
Chilipepper Rockfish	Discarded	0	0%
	Retained	609	100%
	Total Catch	609	
Copper Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Cowcod Rockfish	Discarded	0	0%
	Retained	2	100%
	Total Catch	2	
Darkblotched Rockfish	Discarded	0	0%
	Retained	0	100%
	Total Catch	0	
Flag Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Greenblotched Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Greenspotted Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Greenstriped Rockfish	Discarded	14	15%
	Retained	80	85%
	Total Catch	94	
Pink Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Redbanded Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	

Table 5. Summary of discarded, retained, and total catch (pounds) for 40 groundfish species/market category caught in a modified Scottish seine during the exempted fishing permit study from October 18 to November 10, 2004.

Species	Disposition	Pounds	Percent
Shortbelly Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Splitnose Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Striptail Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Group Rose Rockfish	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Thornyheads			
Longspine Thornyhead	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Shortspine Thornyhead	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Flatfish			
Dover Sole	Discarded	5	100%
	Retained	0	0%
	Total Catch	5	
English Sole	Discarded	665	16%
	Retained	3,563	84%
	Total Catch	4,228	
Sanddab spp.	Discarded	757	19%
	Retained	3,127	81%
	Total Cach	3,884	
Petale Sole	Discarded	310	2%
	Retained	16,332	98%
	Total Catch	16,642	
Rock Sole	Discarded	7	100%
	Retained	0	0%
	Total Catch	7	
Rex Sole	Discarded	5	50%
	Retained	5	50%
	Total Catch	10	
Sand Sole	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	

Table 5. Summary of discarded, retained, and total catch (pounds) for 40 groundfish species/market category caught in a modified Scottish seine during the exempted fishing permit study from October 18 to November 10, 2004.

Species	Disposition	Pounds	Percent
Starry Flounder	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Turbot spp.	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Curlfin Turbot	Discarded	71	100%
	Retained	0	0%
	Total Catch	71	
Roundfish			
Lingcod	Discarded	147	93%
	Retained	11	7%
	Total Catch	158	
Pacific Hake	Discarded	69	100%
	Retained	0	0%
	Total Catch	69	
Sablefish	Discarded	27	10%
	Retained	245	90%
	Total Catch	272	
Sharks			
Leopard Shark	Discarded	0	0%
	Retained	0	0%
	Total Catch	0	
Spiny Dogfish	Discarded	4	100%
	Retained	0	0%
	Total Catch	4	
Skates and Ratfish			
Big Skate	Discarded	4	100%
	Retained	0	0%
	Total Catch	4	
California Skate	Discarded	749	100%
	Retained	0	0%
	Total Catch	749	
Longnose Skate	Discarded	638	100%
	Retained	0	0%
	Total Catch	638	
Skate ssp.	Discarded	0	0%
	Retained	1,225	100%
	Total Catch	1,225	
Ratfish	Discarded	455	100%
	Retained	0	0%
	Total Catch	455	

Table 6. Ratio estimates of discard for 21 groundfish species caught in a selective flatfish trawl net during the exempted fishing permit study from October 21 to December 29, 2004.

Species	Period	Number of Tows	Discarded lb-per-hr (lb/hr)	Discarded lb-per-lb Target	Discarded lb-per-lb Groundfish
Flatfish					
Dover Sole	Sep.-Oct.	12	0.97	0.0007	0.0005
	Nov.-Dec.	61	0.49	0.0007	0.0006
Curlfin Turbot	Sep.-Oct.	12	0.47	0.0004	0.0002
	Nov.-Dec.	61	2.00	0.0031	0.0026
Turbot spp.	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.00	0.0000	0.0000
English Sole	Sep.-Oct.	12	41.70	0.0322	0.0218
	Nov.-Dec.	61	30.15	0.0469	0.0389
Petrale Sole	Sep.-Oct.	12	0.57	0.0004	0.0003
	Nov.-Dec.	61	0.08	0.0001	0.0001
Rex Sole	Sep.-Oct.	12	1.83	0.0014	0.0010
	Nov.-Dec.	61	0.55	0.0009	0.0007
Rock Sole	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.00	0.0000	0.0000
Sanddab spp.	Sep.-Oct.	12	15.88	0.0123	0.0083
	Nov.-Dec.	61	27.35	0.0413	0.0344
Sand Sole	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.00	0.0000	0.0000
Starry Flounder	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	2.27	0.0034	0.0029
Thornyheads					
Longspine Thornyhead	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.00	0.0000	0.0000
Roundfish					
Lingcod	Sep.-Oct.	12	38.87	0.0300	0.0204
	Nov.-Dec.	61	9.18	0.0143	0.0119
Pacific Hake	Sep.-Oct.	12	0.25	0.0002	0.0001
	Nov.-Dec.	61	1.84	0.0029	0.0024
Sablefish	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.33	0.0005	0.0004
Sharks					
Leopard Shark	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.00	0.0000	0.0000
Spiny Dogfish	Sep.-Oct.	12	0.36	0.0003	0.0002
	Nov.-Dec.	61	20.97	0.0326	0.0271
Skates and Ratfish					
Big Skate	Sep.-Oct.	12	0.43	0.0003	0.0002
	Nov.-Dec.	61	26.51	0.0413	0.0342
California Skate	Sep.-Oct.	12	4.23	0.0033	0.0022
	Nov.-Dec.	61	11.55	0.0180	0.0149

Table 6. Ratio estimates of discard for 21 groundfish species caught in a selective flatfish trawl net during the exempted fishing permit study from October 21 to December 29, 2004.

Species	Period	Number of Tows	Discarded lb-per-hr (lb/hr)	Discarded lb-per-lb Target	Discarded lb-per-lb Groundfish
Longnose Skate	Sep.-Oct.	12	60.56	0.0468	0.0317
	Nov.-Dec.	61	40.08	0.0624	0.0517
Skate spp.	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.00	0.0000	0.0000
Ratfish	Sep.-Oct.	12	80.75	0.0624	0.0423
	Nov.-Dec.	61	50.49	0.0786	0.0652

Table 7. Ratio estimates of discard for 21 groundfish species caught in a modified Scottish seine during the exempted fishing permit study from October 18 to November 10, 2004.

Species	Period	Number of Tows	Discarded lb-per-hr (lb/hr)	Discarded lb-per-lb Target	Discarded lb-per-lb Groundfish
Flatfish					
Dover Sole	Sep.-Oct.	27	0.02	0.0001	0.0001
	Nov.-Dec.	16	0.13	0.0003	0.0002
Curlfin Turbot	Sep.-Oct.	27	0.37	0.0027	0.0024
	Nov.-Dec.	16	1.59	0.0033	0.0030
Turbot spp.	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
English Sole	Sep.-Oct.	27	2.30	0.0164	0.0146
	Nov.-Dec.	16	16.91	0.0349	0.0323
Petrale Sole	Sep.-Oct.	27	0.04	0.0003	0.0002
	Nov.-Dec.	16	9.63	0.0199	0.0184
Rex Sole	Sep.-Oct.	27	0.07	0.0005	0.0005
	Nov.-Dec.	16	0.03	0.0001	0.0001
Rock Sole	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.22	0.0005	0.0004
Sanddab spp.	Sep.-Oct.	27	12.70	0.0910	0.0808
	Nov.-Dec.	16	2.22	0.0046	0.0042
Sand Sole	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Starry Flounder	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Thornyhead					
Longspine Thornyhead	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Roundfish					
Lingcod	Sep.-Oct.	27	0.56	0.0040	0.0035
	Nov.-Dec.	16	3.66	0.0076	0.0070
Pacific Hake	Sep.-Oct.	27	1.07	0.0077	0.0068
	Nov.-Dec.	16	0.34	0.0007	0.0007
Sablefish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.84	0.0017	0.0016
Sharks					
Leopard Shark	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Spiny Dogfish	Sep.-Oct.	27	0.06	0.0004	0.0004
	Nov.-Dec.	16	0.03	0.0001	0.0001
Skates and Ratfish					
Big Skate	Sep.-Oct.	27	0.07	0.0005	0.0005
	Nov.-Dec.	16	0.00	0.0000	0.0000
California Skate	Sep.-Oct.	27	4.91	0.0352	0.0312
	Nov.-Dec.	16	15.13	0.0642	0.0289

Table 7. Ratio estimates of discard for 21 groundfish species caught in a modified Scottish seine during the exempted fishing permit study from October 18 to November 10, 2004.

Species	Period	Number of Tows	Discarded lb-per-hr (lb/hr)	Discarded lb-per-lb Target	Discarded lb-per-lb Groundfish
Longnose Skate	Sep.-Oct.	27	7.46	0.0535	0.0475
	Nov.-Dec.	16	7.38	0.0152	0.0141
Skate spp.	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Ratfish	Sep.-Oct.	27	8.37	0.0600	0.0532
	Nov.-Dec.	16	0.09	0.0002	0.0002

Table 8. Ratio estimates of the total bycatch for 30 species of non-target groundfish/market categories including overfished rockfish caught in a selective flatfish trawl net during the exempted fishing permit study from October 21 to December 29, 2004.

Species	Period	Number of Tows	Bycatch lb-per-hr (lb/hr)	Bycatch lb-per-lb Target	Bycatch lb-per-lb Groundfish
Rockfish					
Bank Rockfish	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.03	0.0000	0.0000
Blackgill Rockfish	Sep.-Oct.	12	3.51	0.0026	0.0016
	Nov.-Dec.	61	0.14	0.0002	0.0001
Bocaccio Rockfish	Sep.-Oct.	12	64.11	0.0473	0.0297
	Nov.-Dec.	61	24.52	0.0348	0.0246
Canary Rockfish	Sep.-Oct.	12	0.11	0.0001	0.0000
	Nov.-Dec.	61	0.02	0.0000	0.0000
Chilipepper Rockfish	Sep.-Oct.	12	46.11	0.0340	0.0214
	Nov.-Dec.	61	29.52	0.0419	0.0296
Copper Rockfish	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.07	0.0001	0.0001
Cowcod Rockfish	Sep.-Oct.	12	3.80	0.0028	0.0018
	Nov.-Dec.	61	0.16	0.0002	0.0002
Darkblotched Rockfish	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.05	0.0001	0.0001
Flag Rockfish	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.05	0.0001	0.0001
Greenblotched Rockfish	Sep.-Oct.	12	0.50	0.0004	0.0002
	Nov.-Dec.	61	0.00	0.0000	0.0000
Greenspotted Rockfish	Sep.-Oct.	12	4.88	0.0036	0.0023
	Nov.-Dec.	61	0.27	0.0004	0.0003
Greenstriped Rockfish	Sep.-Oct.	12	2.80	0.0022	0.0013
	Nov.-Dec.	61	0.73	0.0011	0.0007
Pink Rockfish	Sep.-Oct.	12	0.22	0.0002	0.0001
	Nov.-Dec.	61	0.00	0.0000	0.0000
Redbanded Rockfish	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.04	0.0001	0.0001
Shortbelly Rockfish	Sep.-Oct.	12	1.29	0.0010	0.0006
	Nov.-Dec.	61	0.74	0.0010	0.0007
Splitnose Rockfish	Sep.-Oct.	12	48.40	0.0357	0.0225
	Nov.-Dec.	61	0.00	0.0000	0.0000
Striptail Rockfish	Sep.-Oct.	12	17.35	0.0128	0.0080
	Nov.-Dec.	61	0.07	0.0001	0.0001
Group Rose Rockfish	Sep.-Oct.	12	241.09	0.1779	0.1263
	Nov.-Dec.	61	59.79	0.0848	0.0599
Thornyheads					
Longspine Thornyhead	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.11	0.0002	0.0001

Table 8. Ratio estimates of the total bycatch for 30 species of non-target groundfish/market categories including overfished rockfish caught in a selective flatfish trawl net during the exempted fishing permit study from October 21 to December 29, 2004.

Species	Period	Number of Tows	Bycatch lb-per-hr (lb/hr)	Bycatch lb-per-lb Target	Bycatch lb-per-lb Groundfish
Shortspine Thornyhead	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.07	0.0001	0.0001
Roundfish					
Lingcod	Sep.-Oct.	12	138.97	0.1025	0.0645
	Nov.-Dec.	61	16.08	0.0228	0.0161
Pacific Hake	Sep.-Oct.	12	0.25	0.0002	0.0001
	Nov.-Dec.	61	1.84	0.0026	0.0018
Sablefish	Sep.-Oct.	12	62.24	0.0459	0.0289
	Nov.-Dec.	61	4.91	0.0076	0.0049
Sharks					
Leopard Shark	Sep.-Oct.	12	0.00	0.0000	0.0000
	Nov.-Dec.	61	0.68	0.0010	0.0007
Spiny Dogfish	Sep.-Oct.	12	0.36	0.0003	0.0002
	Nov.-Dec.	61	20.97	0.0326	0.0210
Skates and Ratfish					
Big Skate	Sep.-Oct.	12	0.43	0.0003	0.0002
	Nov.-Dec.	61	26.51	0.0400	0.0333
California Skate	Sep.-Oct.	12	4.23	0.0033	0.0022
	Nov.-Dec.	61	11.55	0.0174	0.0145
Longnose Skate	Sep.-Oct.	12	60.56	0.0447	0.0281
	Nov.-Dec.	61	40.08	0.0624	0.0401
Skate spp.	Sep.-Oct.	12	18.64	0.0138	0.0086
	Nov.-Dec.	61	3.86	0.0055	0.0039
Ratfish	Sep.-Oct.	12	80.75	0.0596	0.0375
	Nov.-Dec.	61	50.49	0.0786	0.0506

Table 9. Ratio estimates of the total bycatch for 30 species of non-target groundfish/market category including overfished rockfish caught in a modified Scottish seine during the exempted fishing permit study from October 18 to November 10, 2004.

Species	Period	Number of Tows	Bycatch lb-per-hr (lb/hr)	Bycatch lb-per-lb Target	Bycatch lb-per-lb Groundfish
Rockfish					
Bank Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Blackgill Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Bocaccio Rockfish	Sep.-Oct.	27	0.28	0.0018	0.0014
	Nov.-Dec.	16	0.16	0.0003	0.0003
Canary Rockfish	Sep.-Oct.	27	0.02	0.0001	0.0001
	Nov.-Dec.	16	0.00	0.0000	0.0000
Chilipepper Rockfish	Sep.-Oct.	27	3.70	0.0239	0.0189
	Nov.-Dec.	16	12.78	0.0248	0.0220
Copper Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Cowcod Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.06	0.0001	0.0001
Darkblotched Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Flag Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Greenblotched Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Greenspotted Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Greenstriped Rockfish	Sep.-Oct.	27	0.78	0.0050	0.0040
	Nov.-Dec.	16	1.63	0.0032	0.0028
Pink Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Redbanded Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Shortbelly Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Splitnose Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Striptail Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Group Rose Rockfish	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Thornyheads					
Longspine Thornyhead	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000

Table 9. Ratio estimates of the total bycatch for 30 species of non-target groundfish/market category including overfished rockfish caught in a modified Scottish seine during the exempted fishing permit study from October 18 to November 10, 2004.

Species	Period	Number of Tows	Bycatch lb-per-hr (lb/hr)	Bycatch lb-per-lb Target	Bycatch lb-per-lb Groundfish
Shortspine Thornyhead	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Roundfish					
Lingcod	Sep.-Oct.	27	0.76	0.0049	0.0039
	Nov.-Dec.	16	3.66	0.0071	0.0063
Sablefish	Sep.-Oct.	27	1.52	0.0098	0.0078
	Nov.-Dec.	16	5.94	0.0115	0.0102
Pacific Hake	Sep.-Oct.	27	1.07	0.0069	0.0055
	Nov.-Dec.	16	0.34	0.0007	0.0006
Sharks					
Leopard Shark	Sep.-Oct.	27	0.00	0.0000	0.0000
	Nov.-Dec.	16	0.00	0.0000	0.0000
Spiny Dogfish	Sep.-Oct.	27	0.06	0.0004	0.0003
	Nov.-Dec.	16	0.03	0.0001	0.0001
Skates and Ratfish					
California Skate	Sep.-Oct.	27	4.91	0.0316	0.0251
	Nov.-Dec.	16	15.13	0.0294	0.0260
Big Skate	Sep.-Oct.	27	0.07	0.0005	0.0004
	Nov.-Dec.	16	0.00	0.0000	0.0000
Longnose Skate	Sep.-Oct.	27	7.46	0.0481	0.0382
	Nov.-Dec.	16	7.34	0.0143	0.0127
Skate spp.	Sep.-Oct.	27	11.39	0.0734	0.0583
	Nov.-Dec.	16	19.06	0.0370	0.0328
Ratfish	Sep.-Oct.	27	8.37	0.0540	0.0428
	Nov.-Dec.	16	0.09	0.0002	0.0002

Table 10. Number of biological measurements and samples collected from fish caught in the selective flatfish trawl and modified Scottish seine gears during the exempted fishing permit study from October 18 to December 29, 2004.

	Number of Length Samples		Number of Sex Samples		Number of Maturity Samples		Aging Structures Harvested	
Species	**Trawl**	**Seine**	**Trawl**	**Seine**	**Trawl**	**Seine**	**Trawl**	**Seine**
Rockfish								
Bocaccio Rockfish	73	11	78	3	78	3	x	x
Chilipepper Rockfish	228	173	228	16	228	16	x	x
Canary Rockfish	1		1		1		x	
Cowcod Rockfish	24	7	24	3	24	3	x	x
Darkblotched Rockfish	1		1		1			
Greenblotched Rockfish	5		5		5			
Greenspotted Rockfish	20		20		20		x	
Greenstriped Rockfish	5	211	5	31	5	31		
Halfbanded Rockfish	3	9	3	9	3	9		x
Pink Rockfish	1		1		1		x	
Shortbelly Rockfish	7	10	7	7	7	9		x
Striptail Rockfish	1	9	1	9	1			x
Flatfish								
English Sole	59		59		59			
Petrale Sole	90		90		57		x	
Rock Sole	1		1			7		
Roundfish								
Lingcod	102	25	99	3	99	3	x	
[1]Lingcod	20	86						
Total	641	541	623	81	589	81		

[1]-Length measurements for lingcod discarded at sea.

Table 11. Bycatch rates for each overfished rockfish caught during the Oregon Department of Fish and Wildlife's 2003 and the California Department of Fish and Game's 2004 selective flatfish trawl (including Scottish seine) exempted fishing permit studies per 2-month landing limit period. Oregon did not observer tows during the months of November and December 2003.

		Bycatch lb/lb Target			Bycatch lb/lb Groundfish		
		Oregon[1]	California		Oregon[1]	California	
Overfished Species	**Period**	**trawl**	**trawl**	**seine**	**trawl**	**trawl**	**seine**
Rockfish							
Bocaccio Rockfish	Sep.-Oct.	0.0000	0.0495	0.0020	0.0000	0.0336	0.0018
	Nov.-Dec.	-	0.0370	0.0003	-	0.0308	0.0003
Canary Rockfish	Sep.-Oct.	0.0012	0.0001	0.0001	0.0012	0.0001	0.0001
	Nov.-Dec.	-	0.0000	0.0000	-	0.0000	0.0000
Cowcod Rockfish	Sep.-Oct.	0.0000	0.0029	0.0000	0.0000	0.0020	0.0000
	Nov.-Dec.	-	0.0002	0.0001	-	0.0002	0.0001
Darkblotched Rockfish	Sep.-Oct.	0.0130	0.0000	0.0000	0.0070	0.0000	0.0000
	Nov.-Dec.	-	0.0001	0.0000	-	0.0001	0.0000
Pacific Ocean Perch	Sep.-Oct.	0.0006	0.0000	0.0000	0.0011	0.0000	0.0000
	Nov.-Dec.	-	0.0000	0.0000	-	0.0000	0.0000
Widow Rockfish	Sep.-Oct.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Nov.-Dec.	-	0.0000	0.0000	-	0.0000	0.0000
Yelloweye Rockfish	Sep.-Oct.	0.0002	0.0000	0.0000	0.0004	0.0000	0.0000
	Nov.-Dec.	-	0.0000	0.0000	-	0.0000	0.0000
Roundfish							
Lingcod	Sep.-Oct.	0.0255	0.1074	0.0054	0.0469	0.0728	0.0048
	Nov.-Dec.	-	0.0243	0.0076	-	0.0202	0.0070

1-bycatch estimates taken from Oregon's mixed-shelf flatfish strategy (Parker et al. 2004).

Table 12. Comparison of Scottish seine and bottom trawl gear attributes.

Gear Attribute	Scottish Seine	Bottom Trawl
door	none	yes
footrope (leadline)	2" iron ringlets	8" rollers
headrope (floatline)	longer than footrope	shorter than footrope
warps	rope; length ~1 mile @	steel; length ~ 150' @
tow speed	½ knot/hour	~ 3.0 knot/hour
tow substrait	soft bottom: sand and mud	variable: sand, mud, and cobble

Pacific Mackerel Landings

The National Marine Fisheries Service (NMFS) published the proposed rule to implement the annual harvest guideline for Pacific mackerel on August 29, 2005 (70 FR 99999). The public comment period for the proposed rule ends on September 13, 2005. The final rule will be published as soon as practical. The 2005-2006 Pacific mackerel harvest guideline was 17,419 metric tons (mt) with a directed fishery of 13,419 mt and a reserve of 4,000 mt. The Pacific mackerel season began on July 1, 2005, and ends on June 30, 2006. As of August 9, 2005, only 181 mt of Pacific mackerel had been landed.

Pacific Sardine 2005 Harvest Guideline and Landings

Based on a biomass estimate of 1,193,515 mt, the harvest guideline for Pacific sardine for January 1, 2005, through December 31, 2005, is 136,179 mt. The harvest guideline was allocated one-third for the northern subarea, which is north of 39° 00' N latitude (Pt. Arena, California) to the Canadian border, and two-thirds for southern subarea, which is south of 39° 00' N latitude to the Mexican border. For 2005, the northern subarea was allocated 45,393 mt; the southern subarea was allocated 90,786 mt. The final rule to implement the 2005 harvest guideline was published on June 22, 2005 (70 FR 36053).

As of August 31, 2005, the northern allocation area had landed 30,997 mt and the southern allocation area has landed 20,050 mt. Therefore, on September 1, 2005, the remaining harvest guideline of 85,132 mt of Pacific sardine was pooled and reallocated to 80% for the southern area (which is 68,106 mt) and 20% for the northern area (which is 17,026 mt). The reallocation of Pacific sardine will be filed, effective, and published in the *Federal Register* in early September 2005. On December 1, 2005, the remainder of the unused portion of the harvest guideline is reallocated to a coastwide harvest guideline.

Pacific Sardine Long-term Allocation—Amendment 11 to CPS FMP

At its June 2005 meeting in Foster City, California, the Council adopted Amendment 11 to the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP). Amendment 11 would revise how Pacific sardine are to be allocated to non-tribal fisheries beginning in 2006. NMFS is currently finalizing the regulatory package for the proposed rule stage and hopes to have the proposed rule published by September 15, 2005.

This new allocation system would (1) be based on a January 1 – December 31 annual season; (2) initially allocate 35% of the harvest guideline coastwide on January 1; (3) allocate 40% of the harvest guideline (plus any unharvested portion from the initial allocation) coastwide on July 1; (4) allocate the 25% of the harvest guideline (plus any unharvested portion from the previous allocations) coastwide on September 15; and (5) change the definition of Subarea A and Subarea B by moving the geographic boundary between the two areas from 35°40' N latitude (Point Piedras Blancas) to 39° N latitude (Point Arena).

The Council also recommended a formal review of the sardine allocation regime in June of 2008. This review would compare the performance of the fishery to the projections used to evaluate the Council-preferred alternative including but not limited to; catch projections, catch shortages by sector, economic benefit analysis, and the utilization of the harvest guideline. The review would also consider all scientific and biological information collected between now and 2008 to assess any changes in the resource.

Pacific Sardine Tribal Fishery

On June 10, 2005, NMFS, Southwest Region received a letter from the Makah Tribe requesting that provision be made for a treaty harvest of Pacific sardines starting in the 2006 fishing season. The CPS FMP recognizes the rights of treaty Indian tribes to harvest Pacific sardine and provides a framework for the development of a tribal allocation. At the June 2005 Council meeting, the Council created the Ad Hoc Sardine Tribal Allocation Committee made up of state, federal, and tribal representatives, to begin to work on this issue. There have been informal discussions with the Makah Tribe but no formal discussions about the amount of Pacific sardine they intend to harvest.

Plans for a Coastwide Pacific Sardine Survey

NMFS-Southwest Fisheries Science Center is making plans for a coastwide (U.S. Exclusive Economic Zone off the states of California, Oregon, and Washington) near-synoptic (two-ship) survey of Pacific sardine to be conducted during April 2006. Objectives of the survey will be to describe the spatial distribution of eggs, larvae and adults, obtain measurements of egg production and adult fecundity required for an estimate of spawning biomass, and collect environmental data that may be useful for describing spawning habitat. The survey design will consist of regularly spaced stations along a series of inshore/offshore transects following an extended CalCOFI pattern. Primary station observations will include: a) pelagic trawl samples of adult fish; b) plankton net samples of eggs, larvae, and zooplankton; and c) vertical profiles of temperature, salinity, oxygen and chlorophyll. Primary transect observations will include: a) continuous egg pump samples; b) continuous multi-frequency acoustic samples of adult fish; and c) continuous measurements of sea surface and meteorological conditions. Other observation protocols may be added as time, space and personnel allow. Tentative plans also include a complementary survey by Mexican scientists of waters off northern Baja California.

CPS Pilot Observer Program

NMFS initiated a pilot observer program on California purse seine fishing vessels landing CPS in July 2004. The pilot observer program's main focus is to gather data on total catch and bycatch, and on interactions between their fishing gear and protected species such as marine mammals, sea turtles, and sea birds.

> As of August 22, 2005, observers have completed 80 vessel trips ranging from Morro Bay, California, to San Diego, California. Out of 80 trips, 35 targeted Pacific sardine, 6 targeted northern anchovy, 2 targeted Pacific mackerel, and 37 targeted market squid. NMFS will be producing a detailed report on the pilot observer programs sampling protocol, results and future aspects of the program for the November 2005 Council meeting. NMFS will be seeking guidance on developing a CPS observer protocol plan.

Krill Update

There was a meeting of krill experts to discuss krill biology and population dynamics on June 6, 2005, in La Jolla, California, as the first step in determining whether the krill biomass can be estimated. The contracted biologists will provide a summary of the June 6th meeting and an alternatives analysis to the Council at the November 2005 meeting. This alternatives analysis will not include estimates of maximum sustainable yield (MSY) for krill. Additional time for the development of a krill MSY is necessary and can be afforded as a defined MSY level is only required when the regulations are developed.

Essential Fish Habitat for CPS

The Magnuson-Stevens Fishery Conservation and Management Act requires cooperation among NMFS, the Councils, fishing participants, federal and state agencies, and others in achieving essential fish habitat (EFH) protection, conservation, and enhancement. Each Council and NMFS are expected to review the EFH components of FMPs at least once every five years, update EFH information, and prepare a revised FMP amendment if necessary.

The CPS Management Team reviewed CPS EFH in 2004 and concluded in its report to the Council that they were "not aware of any new information that could warrant modification of current EFH designations for CPS." NMFS-Southwest Regional Office and the Office of Habitat Conservation at NMFS Headquarters, approved a procedure under which the Team was tasked with writing a detailed report of their five-year review of CPS EFH in the 2005 Stock Assessment and Fishery Evaluation (SAFE) document. The Council formally completed this review process by adopting the 2005 SAFE document and the existing definition of CPS EFH at the June Council meeting.

Application for Exempted Fishing Permit to Test Bycatch Reduction Devices in Experimental spot prawn trawl Fishery

Date of Application: May 23, 2005

Applicant: Southern California Trawler's Association
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Santa Barbara, CA 93109
Contact Person: Captain Mike McCorkle
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Applicant Signature: Mike McCorkle

Application for Exempted Fishing Permit to Test Bycatch Reduction Devices in Experimental spot prawn trawl Fishery

Brief Description of Proposal (Purpose and Goals)

The purpose of this exempted fishing permit (EFP) proposal is to gather trawl target species and incidental catch (bycatch) data in order to indicate whether or not a trawl fishery for spot prawns may be conducted in an environmentally responsible and sustainable way in limited areas of soft-bottom habitat along the mainland coast of the Santa Barbara Channel.

The goals of the research are
1) to collect data on spot prawn trawl catch and bycatch along the Santa Barbara Channel coastline in soft-bottom habitats in depths at which spot prawns (*Pandalus platyceros*) have been traditionally fished in this area, using depth-stratified trawl sampling techniques.
2) to conduct comparative performance tests on several innovative bycatch reduction devices (BRDs) and/or combinations of BRDs in order to demonstrate the most effective BRD for the small trawl vessels to use in this region to minimize bycatch of groundfish species under stock rebuilding plans.
3) to test the most effective BRD or BRD combination on an array of vessel sizes likely to qualify for and/or conduct spot prawn trawling cost-effectively in the limited soft-bottom coastal habitat in the Santa Barbara Channel.

Specific objectives of these trawl tests include:
1) To find the best BRD or combination of BRDs for artisanal small-boat spot prawn trawlers (groundfish plan exempt trawl) that minimizes a) the bycatch of groundfish subject to stock rebuilding plans, b) bycatch of other groundfish plan species, c) bycatch of other finfish, d) biogenic organisms, e) other invertebrates, and/or f) any potential impacts to essential fish habitat (EFH) from the small-boat, artisanal trawl fishery that originally started the spot prawn market in Southern California.
2) To collect sufficient coastal, soft-bottom spot prawn trawl fishery bycatch information for management decision-making as to the sustainability of this artisanal spot prawn trawl fishery.
3) To re-open, if possible, a coastal soft-bottom trawl fishery for spot prawns in the Santa Barbara Channel, renewing the opportunity for these trawl vessels, which began the spot prawn market, to provide a highly-valued, fresh, local prawn product for local, community markets and seafood consumers in an ecologically sustainable manner, while meeting management goals for groundfish stock rebuilding and preservation of EFH.

Historic Background of Spot Prawn Trawl Fishery in the Santa Barbara Channel

The following description is, in part, paraphrased from the 2001 California Department of Fish and Game report to the Legislature entitled "California's Living Marine Resources: A Status Report."

Trawling for spot prawns in California began as a small-boat artisanal fishery in the Santa Barbara Channel in 1974. Small trawl vessels, principally from Santa Barbara and Ventura Harbors were the first to recognize and develop a local market for the prawn in the Southern California area. These boats trawled primarily in areas of soft bottom, where ridgeback prawns and spot prawns overlap. As in many fisheries, initial success prompted a rapid increase in participants, prompting fishermen and the Department to institute area, time, and gear restrictions to manage the fishery.

When ex-vessel prices rose to $8 to $10 per pound for live prawns, and the Pacific Fisheries Management Council (PFMC or Council) amended the Groundfish Management Plan (GMP) to severely restrict groundfish trawling throughout California, this area's prawn fishery attracted the attention of a number of larger trawl vessels from other areas of California and out-of-state. These larger, higher-horsepower vessels could tow larger nets, and began regular use of large "roller-gear," allowing fishing in hard-bottom habitat that the initial small-boat fleet did not generally have the horsepower to use. Concerns arose from non-government ocean-conservation organizations regarding impacts to such hard-bottom habitats from the use of this roller gear throughout California. These concerns were quickly brought to the attention of the Council and California Fish and Game Commission (Commission).

In 2003, the Council, in amendments to the Groundfish Management Plan, acted on concerns about take of declared-overfished groundfish species, including bocaccio, cowcod, canary and yelloweye rockfish, and lingcod, among others, in both the directed groundfish trawl fishery and so-called "exempt" trawl fisheries managed by the States. In 2003, the Council declared the spot prawn trawl fishery illegal throughout Washington, Oregon and California due to these concerns.

Likewise, in 2003, non-government conservation organizations petitioned the Commission on an emergency basis to close the spot prawn trawl fishery in California due to concerns about both habitat damage and bycatch of overfished groundfish stocks and other species. The Commission, upon receipt and review of a letter from NOAA Fisheries' Southwest Region and an observer report from the Department of Fish and Game, closed the spot prawn trawl fishery throughout California.

Neither the Commission nor the Council closely examined specific fleet components or the technology improvement potential of the spot prawn trawl fleet, nor the historic development of the spot prawn trawl fishery, during the decision process. The resulting decisions were across-the-board closure rather than a more surgical approach to regulating bycatch of overfished species incidental to this prawn fishery, particularly on a regional basis. It is possible, even likely, that at a certain scale and in certain places (specific coastal areas), spot prawn trawl fishing may occur without undue effects on either essential fish habitat or groundfish of concern. Zonal management of fisheries is practiced commonly at both the state and federal level.

<u>Justification for Exemption to Regulations</u>

As noted above, when the Council and Commission halted the spot prawn trawl fishery in California, consideration was not given to the possibility that there might be places, using improved BRD innovations, in which trawling for spot prawns in Southern California on soft-bottom habitats might be undertaken in such a way as to meet Council management goals for rebuilding overfished groundfish stocks and for preservation of EFH. Historic bycatch figures using traditional spot prawn trawl gear were significant enough for NOAA Fisheries to express concern to the Commission about both groundfish bycatch levels and levels of finfish bycatch in general. Since then, innovations in BRDs make it likely that this groundfish plan-exempt spot prawn trawl fishery may be conducted (particularly on the coastal soft-bottom habitat of the Santa Barbara Channel) in such a way as to avoid the concerns expressed by NOAA and the Commission.

The local, artisanal, small-boat trawl fishermen who began the spot prawn trawl fishery in the Santa Barbara Channel noted to the Commission during hearings that they do not catch appreciable quantities of bocaccio, cowcod, lingcod, canary, or yelloweye rockfish (all under rebuilding plans) when they trawl in soft-bottom habitat along the coastline of the Santa Barbara Channel. The DFG Spot Prawn observer report (Riley & Geibel, 2002) speaks to this (see Tables 1, 8, and 9 for Southern California observer data). For lingcod, the report footnotes (Table 8) that this species was not encountered in observed tows (although the same table reports 20 pounds landed). For bocaccio, the report estimates that the entire fleet in the Southern California area, at the highly uncertain extrapolated rate from observer data, would have caught 1,129 pounds of bocaccio in the 2000-2001 season.

When the GMP total allowable catch (TAC) for bocaccio was only 10,000 pounds for the West Coast, this ~ten percent figure may have been unacceptable for the exempted trawl fleet in California. Currently, however, the GMP TAC for bocaccio is 600,000 pounds for all fleets, and a 1,129 pound (estimated) incidental take of bocaccio should be scored quite differently on the overall scorecard.

For the other species of concern (especially those with stock rebuilding plans), only one pound of cowcod was taken in the Southern CA observer program. Cowcod have had significant measures (large Cowcod Conservation Area, Rockfish Conservation Area) taken to promote rebuilding, and the bycatch of that species is insignificant in the spot prawn trawl fishery as reported in the DFG observer data. No canary, and no yelloweye rockfish were reported taken in the DFG observer data for Southern CA. The other rockfish species taken incidental to spot prawn trawling in Southern CA are generally small, highly abundant, and not of significant concern under GMP or ecosystem perspectives. Biogenic organisms such as corals and/or sponges in deep water do not inhabit these soft-bottom habitats along the Santa Barbara Channel mainland coastline.

This proposal is intended to foster improved groundfish and EFH resource conservation and management, with a focus on bycatch reduction, as noted in Council Operating Procedure (COP) 19 guidelines. These experimental trawls may not be made in the Rockfish Conservation Area (RCA) currently, without an EFP. The innovative BRDs or combinations of BRDs would be the only trawl nets allowed to be used in this region to harvest spot prawns, and only under the EFP until further management review of the data has been done.

There are several species of flatfish in the groundfish complex that may be lawfully taken, within limits, during exempt prawn trawling, and this research proposal will encourage full retention and marketing of fishery mortalities of these flatfish stocks to the extent allowable under stock rebuilding plans, and under the guidelines of an EFP and COP 19, which allow for retention and sale of such marketable species, limited by specific day, trip or seasonal limits.

This soft-bottom spot prawn trawl fishery will also aid in data collection on groundfish stocks as the depth stratified sampling regime is conducted. Information that can supplement Southern California Groundfish Survey data will include where managed groundfish species are, and are not, in these depth-stratified trawl samples, for the Santa Barbara Channel coastline. A representative size- and capacity array of trawl boats that have historically fished for spot prawns in this area will be used to conduct these tests, providing useful management information.

By selecting coastal soft-bottom habitats where spot prawns are known to have occurred historically, and by avoiding hard-bottom habitats, this research will inform a more selective fishing strategy for this groundfish plan-exempt fishery that should improve avoidance of species of concern. Via the use of new and/or combinations of BRDs, this research will also encourage innovative gear modifications designed to minimize, to the maximum extent feasible, bycatch of any finfish whatsoever (groundfish species or otherwise) and minimize also any potential effects of such exempt prawn trawling on EFH.

Because the EFP and COP 19 guidelines allow for retention and sale of the spot prawns taken during these trawl tests, this will renew the development of market opportunities for trawl-caught live spot prawns in local markets throughout the Santa Barbara Channel region.

There is ample precedent in Council decisions to support approval of such an application. The Council last year passed motions recommending that NMFS approve three Exempted Fishing Permit (EFP) applications (Council Operating Procedure 19) that involve full observer coverage and many other restrictions and requirements, as follows:

1. Seven permits for trawl fishing north of 48° latitude to demonstrate the ability to target arrowtooth flounder with minimal incidental catch of canary rockfish;

2. Five permits in Northern California to demonstrate the selectivity of vertical hook and line gear in targeting yellowtail rockfish while avoiding canary rockfish;

3. Five permits for trawl fishing off California to demonstrate the ability to target chilipepper rockfish while avoiding bocaccio rockfish.

<u>Potential Impacts of Exempted Activity</u>

There are a number of potential impacts, both positive and negative, from conducting this experimental approach to reducing incidental take of rebuilding groundfish stocks while trawling for spot prawns. It is possible that some incidental take of overfished groundfish stocks will occur. It is possible that incidental take of biogenic organisms such as corals, sponges, or kelp might occur, although this is highly unlikely in the areas purposefully selected for this experiment and potential future fishery. And there exists the possibility that incidental take of other fishes and invertebrates may occur. However, the point of the research is to examine just how to bring take of these non-target, non-marketable species to the absolute minimum. The combined experience of the vessels and fishermen proposed for this research, along with their advisors and associates, bodes well for generating new BRD designs, or combinations of designs, to approach near-zero mortality of rebuilding groundfish stocks, in particular.

Also on the positive ledger, if this research is successful in indicating to the Council's Groundfish Management Team that insignificant levels of take of rebuilding groundfish stocks are taken, a local, artisanal fishery that originally initiated this spot prawn trawl fishery along the mainland coast may be re-instated with no appreciable impact on rebuilding groundfish stocks. This has positive impacts to the original spot prawn trawl vessels, to the ports and harbors infrastructure where these boats are home-ported, and to California seafood consumers who will once again have access to sustainably caught spot prawns from local waters.

<u>Information From Research Useful to Management</u>

The information collected during these experimental/research trawls will provide groundfish plan and EFH managers with useful and necessary information on the potential of small, artisanal trawl vessels to conduct plan-exempt spot prawn trawling in soft bottom habitat along the Santa Barbara Channel mainland coast without significantly affecting the management goals for rebuilding groundfish stocks or protecting EFH. The data may also allow managers to permit such a fishery, in the event that the research shows that the fishery may be conducted in such a way as to do no harm to rebuilding groundfish stocks or EFH. A representative size- and capacity array of trawl boats that have historically fished for spot prawns in this area are proposed to be used to conduct these tests, providing useful management information about likely performance at the scale intended for the fishery.

The data collected is also likely to assist in augmenting Southern California groundfish stock surveys already conducted, specifically to delineate where species of concern do and do not overlap with the spot prawn spatial distribution along the mainland coast of Southern California. It is feasible, and likely, that there are areas where spot prawn trawling may be conducted in this region on a sustainable basis.

Broader Significance of Work

Because the work focuses on bycatch reduction innovations, the information is likely to have broader application for groundfish plan management, particularly where certain kinds of BRDs may not prove practical for relatively small trawl vessels with smaller spool capacities.

The fostering of community-based regional or local fisheries that can be conducted in an environmentally sustainable fashion while avoiding impacts to rebuilding groundfish stocks and to EFH is one of the overall goals of the Magnuson Act, a goal which this proposal speaks to directly. Particularly given the potential for various alternatives currently under consideration for minimizing impacts to EFH by bottom-tending fishing gear, and in conjunction with various management measures that have already been taken to reduce fishing impacts on rebuilding groundfish stocks and EFH such as the buyback program, Rockfish Conservation Area, and Cowcod Conservation Area, along with various initiatives both at the State and Federal level to implement Marine Protected Areas/Marine Reserves/No-Take zones, there is a very real consideration as to how much fleet capacity will remain to foster the maintenance of necessary commercial fishing infrastructure in Southern California ports and harbors. An important component of many of these ports and harbors, as a draw to tourism, or to support continued access to federal dredging funds (as examples), is the rich traditional fishing heritage in the region over the last century. If it can be demonstrated that components of the trawl fishery can be conducted in an environmentally responsible way, one that does not significantly impact the Council's efforts to rebuild groundfish stocks as quickly as possible, then this component of such traditional fishing heritage can be retained as part of the diversity of commercial fishing practices historically conducted in the region. The coastal community social and economic fabric will thus be maintained to the maximum extent feasible while groundfish stocks have the opportunity to rebuild.

Expected Duration of EFP

For Phase 1, each paired set of net comparisons may take a total of 30 tows, for a grand total of 120 paired tows made good. Phase 2 will add a total of 60 additional tows. It is estimated that three tows per field day can be completed when sufficient time for sorting and identifying bycatch is allowed. Thus, approximately 60-80 days afield, for all three boats, total, is estimated to be necessary to accomplish the field work portion of this proposal, allowing for weather and technical contingencies. These field trial days will be conducted across the historic seasonal span of time in which the historic spot prawn trawl fishery was regulated by the California Department of Fish and Game, i.e., February 1, 2006 to September 30, 2006, a total of eight months in data collection.

Vessel Selection Criteria

The best possible way to test relative efficacy of various bycatch reduction devices (BRDs) against each other is with a double-rig vessel capable of towing two trawl nets side-by side simultaneously. This avoids the problem of different time/space coordinates when comparing one trawl with another. A small double-rig trawler can tow two nets separated by only dozens of feet, facilitating direct paired statistical testing of trawl catch/bycatch results. Once the completed series of paired trawl tests is completed (see Description of Research Protocol, below) and a "best" BRD configuration is determined, two other vessels will be selected and employed that typify the range of vessel sizes that are most likely to 1) qualify for and 2) conduct coastal spot prawn trawling in an economically and environmentally sustainable way.

Vessels covered under EFP

F/V SUSAN DIANE, Captain Jim Wylie

This vessel represents about the largest prawn trawl vessel to have been involved in this fishery historically. Captain Jim Wylie, owner of the double-rig trawler F/V SUSAN DIANE (68 feet OA) has been a commercial fisherman since the early 1950s. He has fished both coasts of North America for shrimp, prawns and finfish with a variety of fishing gear. Captain Wylie has been trawling the waters of the central and southern California coastline since 1970, and has been specifically fishing for prawns in the Channel since 1988. His experience running double-rig trawl gear will add greatly to the team's ability to test one net design modification directly against another with respect to efficacy of finfish bycatch reduction in prawn trawls.

F/V NEW HAZARD, Captain Jeff Hepp

This smaller trawl boat represents one of the historic highliners in the spot prawn trawl fleet operating out of Santa Barbara Harbor. A second-generation Santa Barbara Channel commercial fisherman, Capt. Hepp owns and operates the F/V New Hazard (46 feet OA). He has fished the Channel and California waters both nearshore and offshore for over 22 years. He has been trawling for halibut, sea cucumbers, ridgeback shrimp and spot prawns in the waters of the Santa Barbara Channel for over 18 years, and, prior to the closure of the spot prawn fishery, was a consistent producer of spot prawns for the local and regional live and fresh markets in the Santa Barbara area. The involvement of Capt. Hepp will add a small-to-mid-sized trawler to the test trawl mix and also ensure that effort will be undertaken in productive spot prawn grounds that are seasonally variable.

F/V PALM, Captain Randy Harmsen

The trawler Palm is about the smallest boat capable of fishing the depths in which spot prawns have been found traditionally along the mainland coast of the Santa Barbara Channel. Captain Harmsen, owner/operator of the small trawler F/V Palm (36 feet OA) has been commercially fishing the central and south coast of California for over 35 years. He has been trawling for sea cucumbers, halibut, shrimp and prawns in the Santa Barbara Channel for over 18 years. His detailed knowledge of the coastal trawl grounds for finfish, cucumbers and prawns will enhance the project's ability to target areas traditionally used by prawn trawlers, and his small boat trawl gear will demonstrate the efficacy of the best-net designs with a typical small-boat trawler used commonly in the Santa Barbara Channel.

Description of Research Protocol

To test the hypothesis that spot prawn trawling can be conducted in specific local areas of the coastline of the Santa Barbara Channel in an environmentally responsible way that minimizes take of groundfish for which there currently exist stock rebuilding plans, this project will focus on specific soft-bottom areas along the mainland coast of the Santa Barbara Channel, where the abundance of lingcod, bocaccio, cowcod, canary, and/or yelloweye rockfish is likely to minimize to the greatest extent feasible the incidental take of any of these species.

Three boats will be selected, as described above, to include the array of vessel sizes that have traditionally participated in this coastal spot prawn trawl fishery. In order to make direct, side-by-side comparisons of various net modifications intended to focus on the reduction of incidental take of finfish and invertebrates in spot prawn trawls along the coastline in selected areas of the Santa Barbara Channel, it is proposed to use one double-rig trawl boat, the F/V Susan Diane. In the first phase of data collection, a double-rigged paired trawl tow design is, from a statistical design point of view, the best possible method by which to directly compare one BRD design against another. By a series of one-on-one paired trawls using different BRD configurations, this project will demonstrate the relative efficiency of various innovative improvements to traditional spot prawn trawl net design, and arrive at a "best available technology" model that minimizes bycatch in this trawl fishery. After the paired net tests, the overall best BRD design that minimizes all bycatch of concern will be tested on two other trawl vessels of smaller total capacity, to illustrate the characteristics of the entire range of vessel sizes likely to participate in this fishery along the coast of the Channel, and to conduct the trawl tests throughout the depth range and seasonal time frame in which the former spot prawn trawl fishery was conducted.

Trawl Net/BRD Comparison Trial Protocols

Phase 1: Double-Rig Paired Trawls to Improve Finfish Bycatch Reduction

Net X (see descriptions, below) will be paired with Net Y for the first set of trials (See figure 1 for "pictorial" of paired trial series). The order of paired net trials can be determined randomly to test one BRD against another BRD. Once a random order of pairings is established, the two BRD nets (or one "standard" net without BRD) will be alternated between the port and starboard sides of the boat to minimize any systematic error possibly arising from port-starboard performance differences.

Each net pair trawl trial will consist of a one-hour tow. For the live prawn market that most of the vessels formerly serviced, this length of tow is optimal to keep the prawns in high-quality market condition. If, after 10 paired tows, one of the nets is clearly better than the other at bycatch exclusion (10 out of 10 trials one net wins, or 9 out of 10 trials one net wins), that trial will be determined over, and the better net will be paired with the next net in the randomly chosen BRD series, changing only one BRD feature at a time. If results are inconclusive (8 or fewer "wins" out of 10 trials), trials will continue with this first pair of nets to a total of 20 trials. If, after 20 paired trials, one net proves better than the other in 16 or more trials (80% of trials or more), the trial set will be determined to be over, and the better net will be paired with the next net in the design series. If, after 20 trials one net has not met these criteria, trials with this pair of nets will continue to a total of 30 trials, and the "better" net design at the end of trials will move on to the next set of paired trials. Figure 1 graphically illustrates one possible order of the paired-nets test design. In the unlikely event of "ties" in results between any pair of nets, the net retaining the least rockfish under stock rebuilding plans will be judged the better of the two. In the event that this measure is also tied (and/or zero for both nets), the next tiebreaker will be the net design that catches the least habitat-forming organisms such as corals and sponges (an EFH criterion). If that also results in a tie, the total non-marketable bycatch will be used to determine the best net of the pair.

The point of this novel 10-20-30 field test design is to optimize data returned in field efforts with overall experimental design and observer costs. If one net design for bycatch reduction proves clearly and consistently superior to another in any given paired test after 10 paired tows, it would not be reasonable or cost-effective to continue the testing further; additional significance would not be added to the results in a cost-effective manner. This 10-20-30 trials endpoint protocol will be continued for each set of paired trial nets, to arrive at the best possible net configuration and trawling techniques that clearly minimizes bycatch in these localized areas along the mainland coast of the Santa Barbara Channel.

Once the paired trawl trials have concluded with the best net design to minimize interactions with rebuilding stocks of groundfish, other finfish, and other invertebrates including habitat-forming species, Phase 2 of the field work will be conducted.

Phase 2: "Best Net" Trials Using Two Other, Smaller Spot Prawn Trawlers

Two other trawl vessels will be employed to utilize the net design that proved most efficient during the Phase 1 tests. Taken together with the double-rigged trawler, these two other, smaller vessels will illustrate the complete range of sizes of trawlers that are likely to qualify for a "coastal Santa Barbara Channel spot prawn trawl permit" based on prior participation and landings in the area of interest. Each subsequent trawl vessel selected will also tow the "best BRD net" for 30 trials, while data on all bycatch is taken just as in Phase 1 trials. These tows will be conducted in a depth-stratified manner, illustrating bycatch by depth strata and assisting in the delineation of depths at which spot prawn trawling may occur on these soft bottom habitats that minimizes bycatch of rebuilding groundfish stocks.

By the end of these trials, somewhere between 100 and 180 individual one-hour net tows (depending on Phase 1 total required tow number under the 10-20-30 protocol) will be completed. It is expected that bycatch of rebuilding rockfish species will be near zero, and bycatch of other non-marketable finfish and invertebrates will have been reduced to extremely low levels as well. Further, it is expected that the data will demonstrate that habitat-forming species such as corals, sponges, and/or kelp, are not taken in appreciable quantities in this soft-bottom spot prawn trawl habitat along the mainland coast of the Channel.

Description of Trawl Net BRD modifications

Santa Barbara-based trawlers have been in contact with researchers from other parts of the West Coast, Newfoundland and the Gulf of Mexico doing similar research, trading notes and designs in order to arrive at the best possible combinations of devices and trawling techniques to minimize bycatch. Preliminary results from a similar set of tests of various BRDs on ridgeback prawn trawl nets indicate that, using ranked probabilities of the test net catching less bycatch than the "standard" prawn trawl net, the fish-eye with double cod end appears to have the advantage for small trawl vessels such as those in the Santa Barbara Channel that originally began the spot prawn trawl fishery there (report in preparation). Five modifications to a standard or typical 70-foot prawn net will be compared initially in the Phase 1 testing, including:

1. "fish-eye" excluder device (See Figure 2 and Photo A)
2. "dropped footrope" on 5" bobbins (Figure 3).
3. Hard Grate fish excluder (Photo B)

4. 5" mesh double cod end (Figure 5, Photo C)
5. "Soft-panel" fish excluder (Figure 6)

Observer/Monitoring Protocol

NOAA Fisheries-certified observers will accompany each fishing trip under the auspices of this EFP research proposal. Collection of data on target and incidental species taken in each and all trawl tows will be recorded according to NOAA-certified guidelines, principles and practices, including, but not limited to:

- general environmental setting during trawl trip (weather, sea conditions, etc.)
- geographic coordinates of each trawl tow (set and retrieve locations)
- weight of target species
- weight/number of each species of groundfish taken incidental to target fishery
- weight/number of other species of fish and invertebrates taken incidental to target fishery

NOAA Fisheries-approved forms for recording bycatch will be used for these purposes.

Locations and Schedule for Research

Locations: (See Figure 7). The area to be used for the purposes of this demonstration/data collection EFP is generally between Point Conception and Point Mugu, along the coastline of the Santa Barbara Channel. The habitat to be trawled is generally sandy/mud or mud bottom in depths from the three-mile state waters boundary (which ranges from 36 to 83 fathoms in the Channel) out to 165 fathoms of water, in selected locations where concentrations of spot prawns have historically been high enough to warrant commercial take. Figure 7 depicts the areas to be used for these test trawls. Note that depths currently prohibited from trawling in the Rockfish Conservation Area will be tested, to be inclusive of all possible depths that historically were trawled for spot prawns, and the potential overlap of these depths with groundfish of concern. This may assist in the more accurate delineation of depths at which spot prawn trawling may be conducted and not take appreciable numbers of rebuilding groundfish species.
Schedule: February 1, 2006 to September 30, 2006. This represents the former trawl season, which avoids the bulk of the spot prawn spawning time period.

Description of Species to be Harvested, with Harvest Estimates for Target and Incidental Species

The species likely to be taken in this EFP research include

Invertebrates:	**Total Harvest Estimates**	
Spot prawn	10,000 lbs	
Ridgeback shrimp	1,500 lbs	
Various species of sea cucumbers, sea urchins, sea stars,	1,000 lbs	
Various crab species	400 lbs	
Finfish:		
Groundfish under rebuilding plans:		
Rockfish		
Bocaccio	500 lbs	Groundfish Plan Rebuilding Species
Cowcod	50 lbs	
Canary	20 lbs	
Yelloweye	20 lbs	
Widow	20 lbs	
Darkblotched	20 lbs	
Other rebuilding groundfish		
Lingcod	200 lbs	

Groundfish not under rebuilding plans:

Rockfish	
Shortbelly	30 lbs
Stripetail	500 lbs
Vermillion	30 lbs
Chilipepper	80 lbs
Rarely taken, but possible rockfish	
Greenstripe rockfish	50 lbs
Other abundant groundfish	
Sole	
English	800 lbs
Petrale	300 lbs
Sanddabs	1,000 lbs
Blackcod	100 lbs
Pacific Hake	600 lbs

Other finfish:

Common, abundant	
Stargazer	100 lbs
Combfish	
shortspine	500 lbs
longspine	500 lbs
Slender Sole	300 lbs
Skates, rays	300 lbs
Midshipman	1,000 lbs
Rarely taken, but possible finfish	
Sole	
Slender	100 lbs
Dover	100 lbs
Rex	60 lbs
Fantail	50 lbs
Tonguefish	50 lbs

These data are adapted for depth and seasonal differences from preliminary bycatch results of a 2003-2004 ridgeback prawn bycatch reduction study done in the Santa Barbara Channel (report in preparation). These estimates yield a calculated estimate for total-bycatch-to-spot-prawn ratio of 0.86:1, a non-marketable-bycatch-to-spot-prawn ratio of 0.35:1, and a rebuilding-groundfish-to-spot-prawn ratio of 0.07:1.

Data Collection and Analysis Methods

As noted above, all bycatch data will be collected by NOAA Fisheries-certified observers on every trawl made during this exempted fishery permit field work. NOAA-Fisheries observer data recording forms will be used for this purpose. Bycatch data will then be synthesized and summarized into tables to allow easy comparison between paired BRD/net trials, and a summary table will present average per-trawl and overall bycatch for each species of concern.

Figure 1: Illustration of One Possible Order of Paired Nets Trawl Test Design

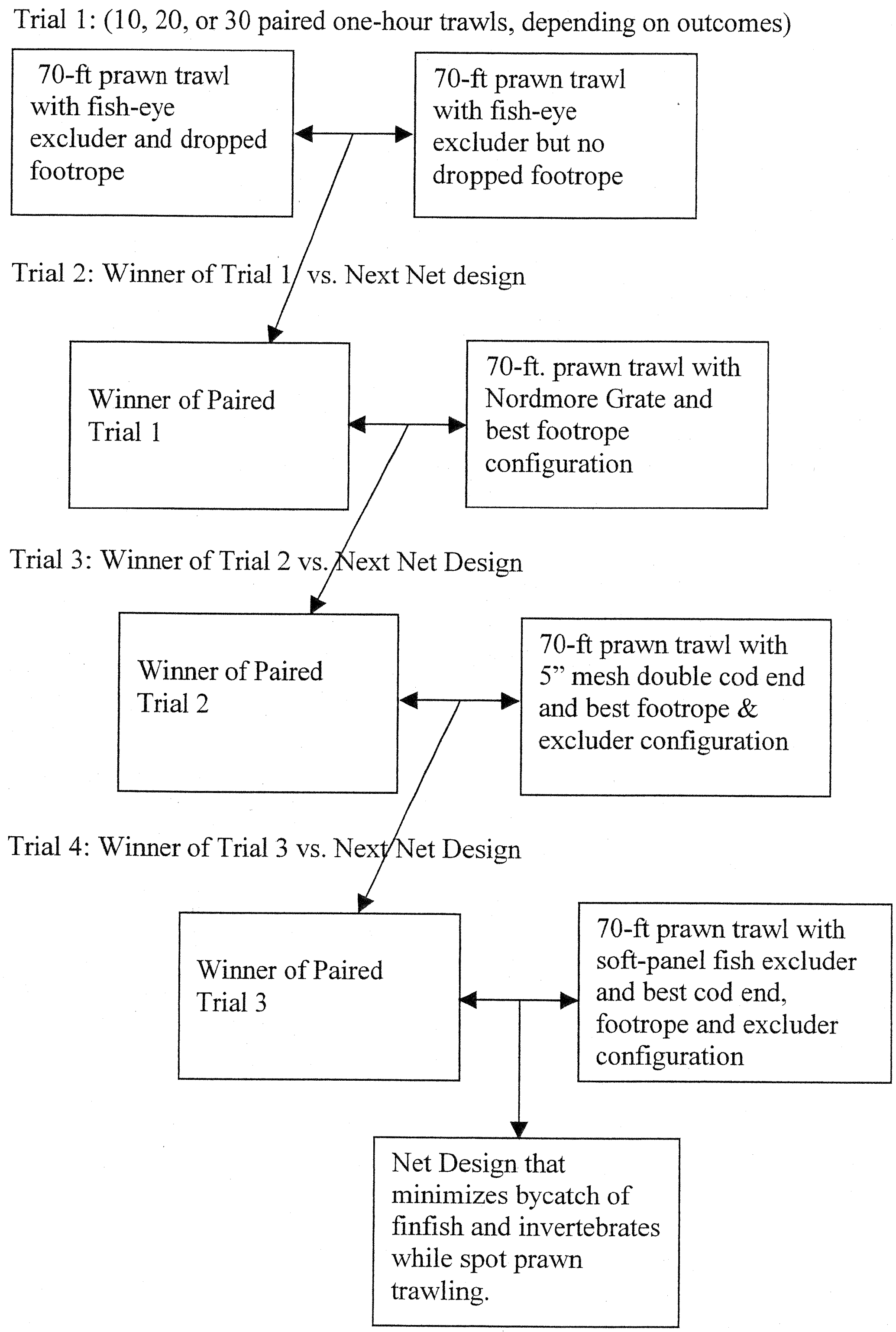


Figure 2. Fish-Eye Excluder Device

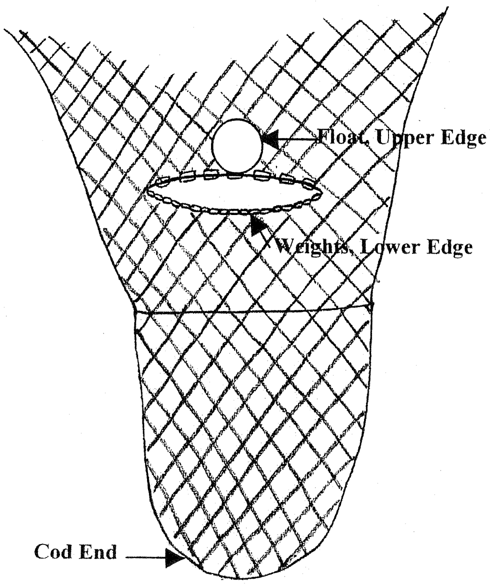


Photo A: Fish-Eye Excluder Device

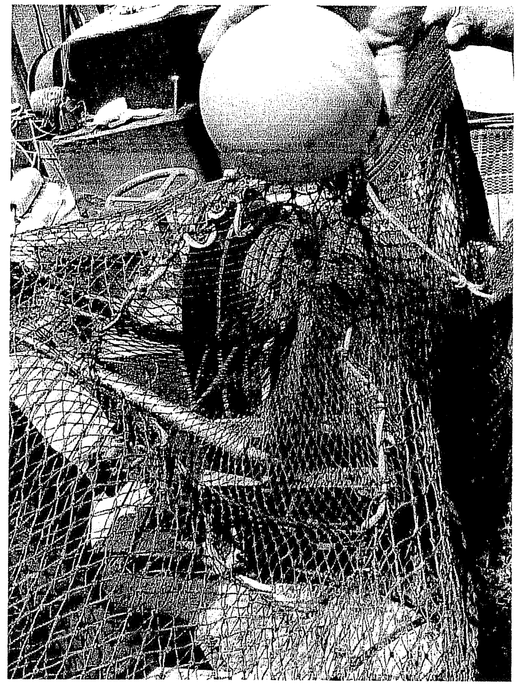


Figure 3. Dropped footrope on 5" bobbins

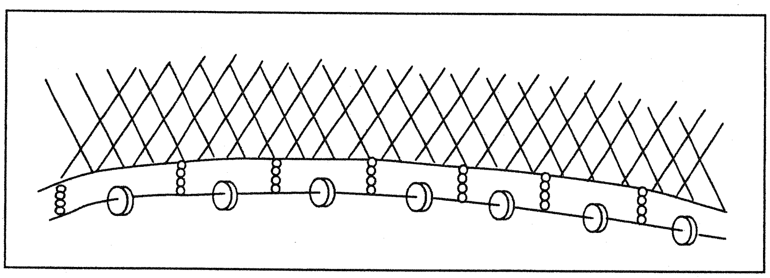


Photo B. Hard Grate BRD

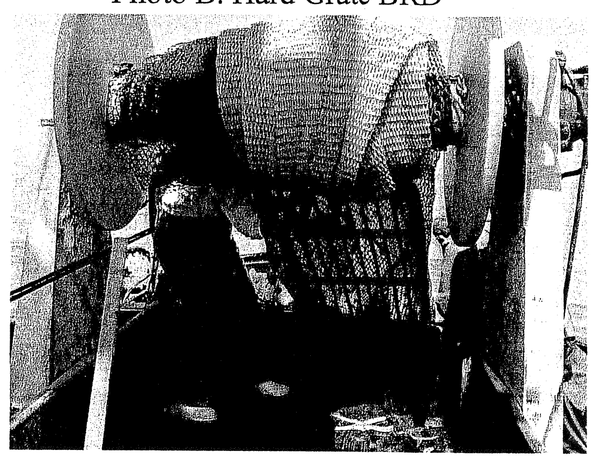


Figure 4. Traditional footrope

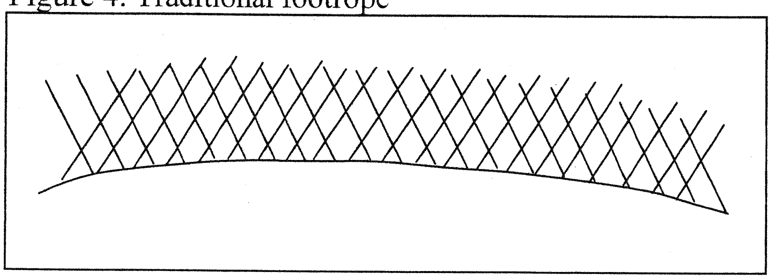


Photo C. Double Mesh Layer Cod End

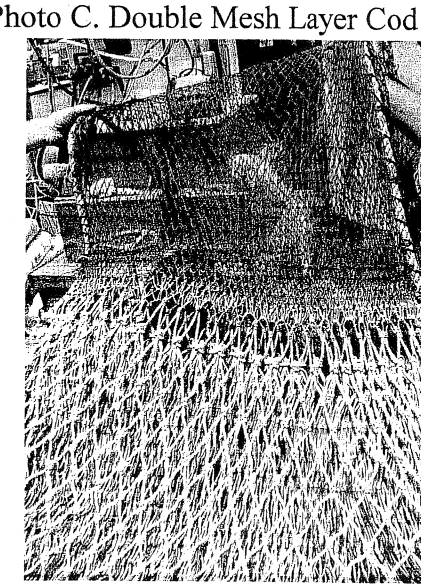


Figure 5. Double Mesh Layer Cod End

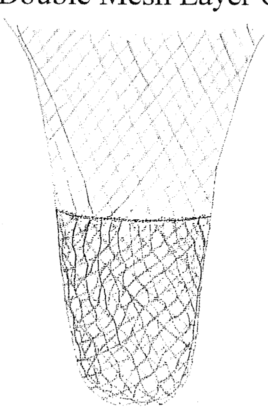


Figure 6. Soft Panel BRD

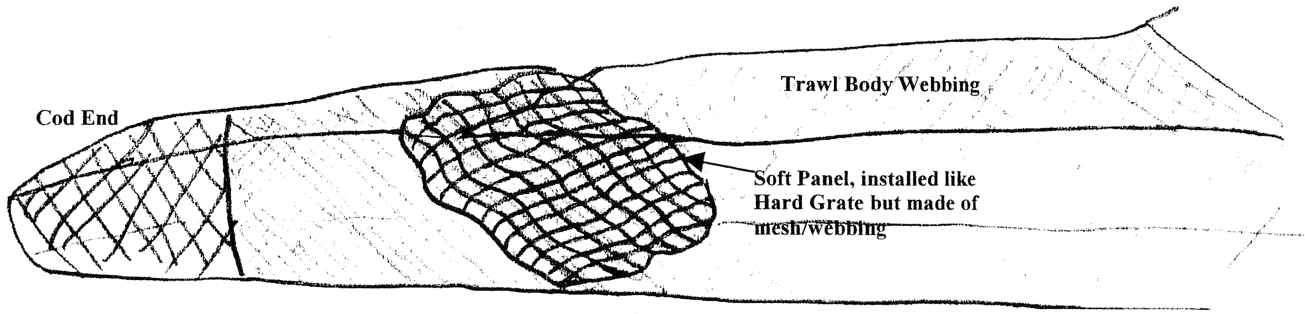
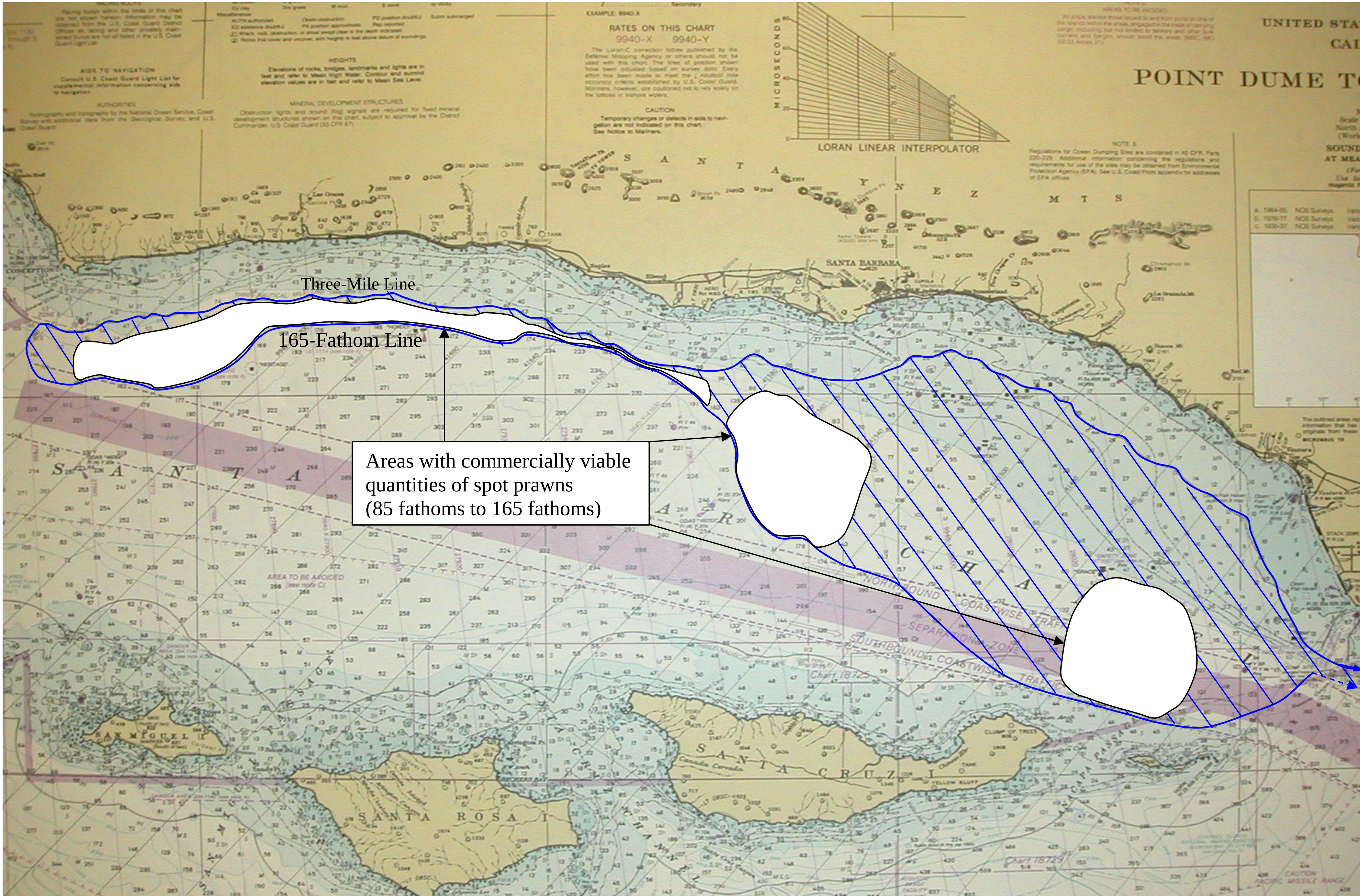


Figure 7
Artisanal Spot Prawn Trawl Grounds, Mainland Coast, Santa Barbara Channel
Federal Waters out to 165 fathoms, Point Conception to Point Dume



EXPERIMENTAL FISHING PERMIT APPLICATION

1. Date of Application

   August 30, 2005

2. Applicant

   Del Mar Seafoods, Inc.
   331 Ford Street
   Watsonville, Ca. 95076

3. Purposes and Goals of the Proposed Experiment

   The goal of this experimental fishing permit is to more closely align the start of the Pacific whiting season, south of the 40°30’ N latitude line, with the presence of the Pacific whiting during their yearly migratory pattern.

   The purpose is to be permitted to catch the Pacific whiting at the time they are available in our area while maintaining due diligence to minimize the amount of bycatch and interaction with species of concern.

4. Justification

   The justification for this EFP is many-fold:

   a) To have a fishery that matches effort and availability.
   b) To have the fishery more closely match the migratory patterns of the Pacific whiting.
   c) To be able to reduce the duration and frequency of tows because of the abundance of the target (whiting) species – More efficient.
   d) Will reduce bycatch by reducing the duration and frequency of tows. – Less time in the water.
   e) Allows the fishermen to fish for another species (Pacific whiting) which will reduce the effort on other species more traditionally fished in this area.
   f) Will facilitate the fishermen to fish for a migratory species (Pacific whiting) which will reduce the effort on a more local, non migratory species.
   g) This early opening will be heavily observed and monitored to facilitate real time biological data for bycatch and any interaction with species of concern.

5. Statement of Project Significance

The main significance of this project is to match the season opening with the availability of the fish in the area south of the 40°30’ N latitude line. It will allow the fishermen to prosecute the fishery in a more logical and viable manner.

There is renewed interest in this fishery for the last couple of years, south of the 40°30’ N latitude line, which has been absent during the previous several years. This lack of interest in the previous years has made the opening date of the previous several years unimportant. This renewed interest has made the opening date for the Pacific whiting season, south of the 40°30’ N latitude line now extremely significant.

This will be the start of a data base for Pacific whiting bycatch in the area south of the 40°30’N latitude line during a one month earlier starting date.

This experiment will also provide scientific data to better understand the Pacific whiting’s migration pattern south of the 40°30’ N latitude line.

6. Vessels to be covered under this EFP

Name(s) of vessel(s) to be provided at a later date. There will be no more then three vessels covered under this EFP

7. Species and Amounts to be Harvested

The target species to be harvested is the Pacific whiting (*Merluccius productus*). The amount to be caught will be no more than 1% of the 2006 U.S. West Coast shoreside Pacific whiting allocation.

For species other than the Pacific whiting: All rules, regulations, bycatch caps and other concerns set forth will apply. There will be 100% plant observer coverage (paid for by the plant). All bycatch data will be fully documented. Any scientific data requested to help with stock assessments, age, sex determination, etc. will be supplied. All data will be transmitted in a timely manner electronically. Any prohibited species will be documented and turned over to the State of California.

Species of concern and bycatch caps:

a) Chinook salmon…………………..50 fish cap (estimated max. 1,000 mt- applied the .05% standard)
b) Coho salmon……………………...10 fish cap
c) Sablefish………………………….800 pound cap.
d) Widow Rockfish………………….800 pound cap.
e) Canary Rockfish………………….150 pound cap.
f) Yelloweye Rockfish……………..…50 pound cap.
g) Darkblotched Rockfish……………300 pound cap.
h) Bocaccio Rockfish………………..600 pound cap.
i) Lingcod ……………………………...1 mt cap.

j) Cowcod………………………………2 fish cap.
k) Pacific whiting…………………...cap of 1% of the 2006 coastwide shoreside Pacific whiting allocation.

These caps represent forty years of personal experience trawl fishing and other personal observations in this geographic area.

8. Conduct of Fishing Experiment

This will be a one month experimental fishing permit from March 15, 2006, to April 15, 2006. Fishing will occur in the EEZ south of the 40°30’ N latitude line and more specifically in the Monterey area. The processing plant will maintain 100% observer coverage. Also, the fishing vessels covered under this EFP will have 100% at-sea observer coverage. We will require any and all vessels covered under this EFP to maintain full retention at all times. All assessments and research funds required will be paid by Del Mar Seafoods, Inc.

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

Lead Agency	National Oceanic and Atmospheric Administration National Marine Fisheries Service Northwest Regional Office Seattle, Washington
Responsible Official	D. Robert Lohn Regional Administrator Northwest Regional Office
For Further Information Contact	Becky Renko National Marine Fisheries Service 7600 Sand Point Way, NE Seattle, WA 98115 (206) 526-6110

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.

March 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.

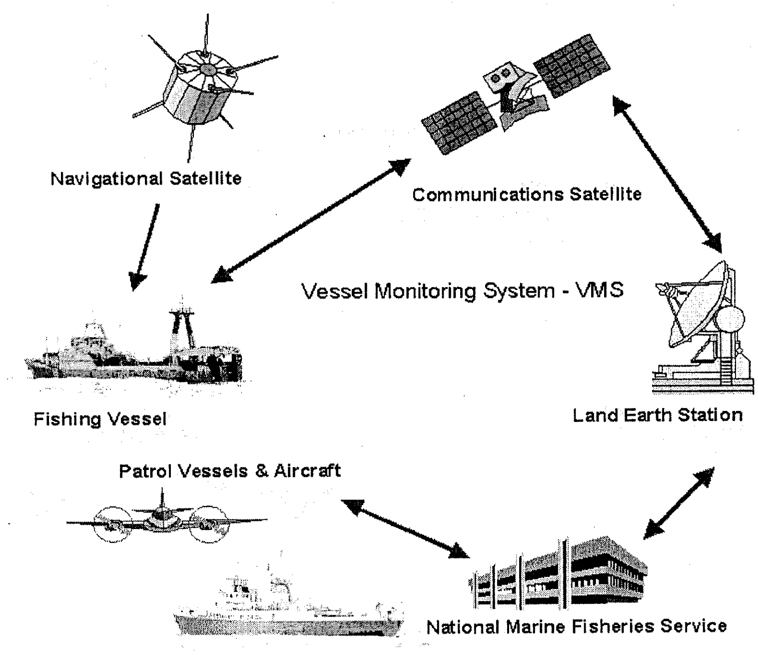

Figure 1.1. Example VMS Scenario

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. Using this criteria, 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 coverage of 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.

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 considered 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 a recommendation 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.

<u>Open access coverage alternatives</u>
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: 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	Number of Vessels by Gear & Target Species that would be required to have VMS a/ b/	Overfished Species 2005 Projected Total Mortality by Gear & Target Species	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	Pink shrimp vessels use finfish excluders to minimize overfished species bycatch	Groundfish directed fisheries Longline, pot, line, and net gear - non-trawl gear RCA applies
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 prohibited in EEZ, nor is it legal groundfish gear.	Longline: Longline-specific projections are not available. Groundfish directed all gears - 10.6 mt bocaccio, 3.0 mt canary, 0.1 mt cowcod, 0.2 mt darkblotched, 100.0 mt lingcod, 0.1 mt pop and 0.3 mt yelloweye. Pacific halibut -XX 0.5 mt XX of yelloweye projected. XXcanary & lingcodXX California halibut, all gears - 0.1 mt of bocaccio, 0.1 canary, and 2.0 mt of lingcod projected	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 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
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 (320 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	Longline - Same as Alt. 2 Pot: Pot-specific projections are not available. Groundfish directed all gears - 10.6 mt bocaccio, 3.0 mt canary, 0.1 mt cowcod, 0.2 mt darkblotched, 100.0 mt lingcod, 0.1 mt pop and 0.3 mt yelloweye. Dungeness crab 0.5 mt of lingcod projected. California sheephead & spot prawn - no overfished species catch projected Ridgeback prawn, all gears - 0.1 mt of bocaccio projected	Incidental fisheries using trawl gear Pink shrimp trawls 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
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 (320 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Spot prawn - trawl gear prohibited Ridgeback prawn - 23 vessels/yr Sea cucumber - 14 vessels/yr California halibut - 40 vessels/yr	Longline - Same as Alt. 2 Pot - Same as Alt. 3 Trawl: Ridgeback prawn - 0.1 mt of bocaccio projected Spot prawn - trawl gear prohibited Sea cucumber - no overfished species catch projected California halibut, all gears - 0.1 mt of bocaccio, 0.1 canary, and 2.0 mt of lingcod projected	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

Table 2.0.1: Continued

VMS COVERAGE ALTERNATIVES	Number of Affected OA Vessels by Gear & Target Species: a/ b/	Overfished Species 2005 Projected Total Mortality by Gear & Target Species	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 (320 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Same as Alt. 4A (77 vessels), except 54 pink shrimp vessels are included (131 vessels)	Longline - Same as Alt. 2 Pot - Same as Alt. 3 Trawl - Ridgeback prawn, all gears vessels - 0.1 mt of bocaccio projected Spot prawn - trawl gear prohibited Sea cucumber - no overfished species catch projected California halibut, all gears - 0.1 mt of bocaccio, 0.1 canary, and 2.0 mt of lingcod projected Pink shrimp - 0.1 mt of bocaccio, 0.1 mt of canary, 0.5 mt of lingcod, 0.1 mt of widow, and 0.1 mt of yelloweye.	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 (320 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	Longline - Same as Alt. 2 Pot - Same as Alt. 3 Trawl - Same as Alt. 4A Line: Line gear specific projections are not available . Groundfish directed all gears - 10.6 mt bocaccio, 3.0 mt canary, 0.1 mt cowcod, 0.2 mt darkblotched, 100.0 mt lingcod, 0.1 mt pop and 0.3 mt yelloweye. California halibut, all gear - 0.1 mt of bocaccio, o.1 canary, and 2.0 mt of lingcod projected HMS - no overfished species catch projected	
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 (320 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)	Longline - Same as Alt. 2 because no overfished species catch was projected for HMS vessels Pot - Same as Alt. 3 except that Dungeness crab vessels which are projected to take 0.5 mt of lingcod would be excluded. Trawl - Same as Alt. 4A Line - Same as Alt.5A, plus salmon troll vessels - 0.2 mt of bocaccio, 1.6 mt canary, 0.3 mt lingcod, 0.3 mt widow, 0.2 mt yelloweye was projected. No overfished species catch was projected for HMS vessels	

Table 2.0.1: Continued

VMS COVERAGE ALTERNATIVES	Number of Affected OA Vessels by Gear & Target Species: a/ b/	Overfished Species 2005 Projected Total Mortality by Gear & Target	RCA Restrictions by Gear & Target Species
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 pink shrimp trawl with any one the following alternatives when it makes its final recommendations.			
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 (385 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Same as Alt. 4A (77 vessels) Line - Same as Alt.5B Net - CPS net gear not legal groundfish gear, HMS net south 25 out of 143 vessels/yr landed groundfish **Other - Same as Alt. 6A, except vessels <12' are excluded**	Longline - Same as Alt. 2, except catch of overfished species by Pacific halibut vessels is less likely to increase due to RCA incursions Pot - Same as Alt. 3 Trawl - Same as Alt. 4A Line - Same as Alt.5A, plus salmon troll vessels - 0.2 mt bocaccio, 1.6 mt canary, 0.3 mt lingcod, 0.3 mt widow, 0.2 mt yelloweye projected. No overfished species catch projected for HMS vessels Net - No overfished species catch projected. **Other - Same as Alt. 6A**	
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 (385 vessels) Pot - Same as Alt. 3 (193 vessels) Trawl - Same as Alt. 4 (77 vessels) Line - Same as Alt.5B, excluding 58 salmon troll vessels operating in waters north of 40°10' N. lat. that retain only yellowtail rockfish (834 vessels) Net - Same as Alt. 6A (25 vessels) **Other - Same as Alt. 6A**	Longline - Same as Alt. 2 Pot - Same as Alt. 3 Trawl - Same as Alt. 4 Line - Same as Alt.6A, north and south specific total catch projections for salmon troll are not available Net - Same as Alt. 6A **Other - Same as Alt. 6A**	Same as identified for Alt. 1-4
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 overall 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 (379 vessels) Pot - Same as Alt. 3 except 2 vessels/yr <12'are excluded (191 vessels) Trawl - Same as Alt. 4 (77 vessels) Line - Same as Alt.5B except 14 vessels/yr <12' are excluded (847vessels) Net - Same as Alt. 6A (25 vessels) **Other - Same as Alt. 6A, except vessels <12' are excluded**	Longline - Same as Alt. 2 Pot - Same as Alt. 3 Trawl - Same as Alt. 4 Line - Same as Alt.6A Net - Same as Alt. 6A **Other - Same as Alt. 6A**	Same as identified for Alt 1-4A

Table 2.0.1: Continued

VMS COVERAGE ALTERNATIVES	Number of Affected OA Vessels by Gear & Target Species: a/ b/	Overfished Species 2005 Projected Total Mortality by Gear & Target	RCA Restrictions by Gear & Target Species
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 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, California sheephead pot gear and Pink shrimp vessels are excluded.	<u>Longline</u> -282 groundfish directed vessels.yr, 65 Pacific halibut vessels/yr (347 vessels) <u>Pot</u> - 142 groundfish directed vessels/yr <u>Trawl</u> -40 CA halibut vessels, <u>Line</u> - 590 groundfish directed vessels/yr, 234 salmon troll vessels/yr, and 58 CA halibut vessels/yr. (882 vessels) <u>Net</u> - 25 vessels/yr	<u>Longline</u> -Same as Alt. 6A <u>Pot</u> -Same as Alt. 3 except Dungeness crab fishery would not be included which is projected to take 0.5 mt of lingcod. <u>Trawl</u> - All CA halibut gear, most of which is assumed to be for trawl interactions include, 0.1 mt bocaccio, 0.1 mt canary, and 2.0 mt of lingcod. <u>Line</u> - Same as Alt. 5B <u>Net</u> - 0.5 mt of bocaccio projected to be taken by CA halibut gillnet vessels would be include	Same as identified for Alt 1-4A
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 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 exceeds 50% of all landed catch on that trip." The following vessels would be included: 282 groundfish directed longline vessels/yr, 142 groundfish directed pot gear vessels/yr, 590 groundfish directed vessels/yr	<u>Longline</u> - 282 groundfish directed longline vessels/yr, and 6 Pacific halibut vessels/yr (14 vessels if only 2003 & 2004 data used). HMS - longline gear prohibited in EEZ. <u>Pot</u> - 142 groundfish directed pot gear vessels/yr, 1 Dungeness crab vessel/yr, 2 prawn vessels/yr, and 2 California sheephead (CA nearshore.) vessels/yr <u>Trawl</u> - 9 California halibut vessels <u>Line</u> - 590 groundfish directed vessels/yr, no California halibut vessels, 1 HMS vessel, and 6 salmon troll vessels <u>Net</u> - 25 vessels/yr	Groundfish directed, all gears - 10.6 mt bocaccio, 3.0 mt canary, 0.1 mt cowcod, 0.2 mt darkblotched, 100.0 mt lingcod, 0.1 mt pop and 0.3 mt yelloweye. <u>Longline</u> - Same as Alt. 6A except that overfished species catch by Pacific halibut vessels may increase if incursions occur because only 6 of 65 Pacific halibut vessels/yr would have VMS. <u>Pot</u> -Same as Alt. 3. Incidental fisheries projected catch would remain unchanged though Dungeness crab vessels may choose not to retain lingcod. <u>Trawl</u> - Same as 4B, except that overfished species catch by CA halibut vessels may increase if incursions occur with only 9 of 40 CA halibut vessels/yr having VMS. <u>Line</u> - Similar to 5A <u>Net</u> - Same as Alt. 8	Same as identified for Alt 1-4A
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 adust trip limits and seasons accordingly. Require declaration reports from OA non-groundfish trawl vessels that fish within a trawl RCA	No OA vessels would be required to have VMS	Overfished species catch is expected to increase over Alternative 1 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.	No RCA restrictions

a/ Unless other wise noted, the number of vessels is the average number of participants for the years 2000-2004.
b/ The 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 compliance. 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 all landed catch on that trip. 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. Gear specific overfished species catch projections were not available for the directed OA gears. For the California halibut fishery, overfished species projections for 2005 were combined for trawl and longline gear. The California halibut overfished species catch projections for 2005 were 0.1 mt of bocaccio, 0.1 mt of canary rockfish and 2.0 mt of lingcod. Overfished species from the Pacific halibut fishery were projected to be 0.5 mt of yelloweye rockfish XXcanary & lingcodXX for 2005. 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 verticle 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 all landed catch on that trip. 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.

Overfished species interactions in the directed groundfish fisheries are projected to include bocaccio, canary rockfish, cowcod, darkblotched rockfish, lingcod, POP and yelloweye rockfish. Gear specific overfished species catch projections were not available for the directed OA gears. Overfished species catch was projected for the Dungeness crab was 0.5 mt of lingcod and for the no overfished species were projected for the prawn pot gear fisheries in 2005. California sheephead are caught in the nearshore fishery in California. Overfished species bycatch projections for the California nearshore fisheries were included in the direct fisheries impact estimates for 2005.

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.

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.

No overfished species catch was projected for the sea cucumber trawl fishery for 2005. The 2005 projected overfished species catch in the ridgeback prawn trawl fishery was 0.1 mt of bocaccio. Gear specific overfished species catch projections were not available for the California halibut trawl fishery. However, the 2005 projections for all gears targeting California halibut is 0.1 mt of bocaccio, 0.1 mt of canary rockfish and 2.0 mt of lingcod.

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.

No overfished species catch was projected for the sea cucumber trawl fishery for 2005. The 2005 projected overfished species catch in the ridgeback prawn trawl fishery was 0.1 mt of bocaccio. Gear specific overfished species catch projections were not available for the California halibut trawl fishery. However, the 2005 projections for all gears targeting California halibut is 0.1 mt of bocaccio, 0.1 mt of canary rockfish, and 2.0 mt of lingcod. Overfished species bycatch projections for the pink shrimp fisheries were 0.1 mt of bocaccio, 0.1 mt of canary rockfish, 0.5 mt of lingcod, 0.1 mt of widow rockfish, and 0.1 mt of yelloweye rockfish for 2005.

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 all landed catch on that trip. 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.

Overfished species interactions in the directed groundfish fisheries were projected to include bocaccio, canary rockfish, cowcod, darkblotched rockfish, lingcod, POP and yelloweye rockfish. Gear specific overfished species catch projections were not available for the directed OA gears nor were gear specific overfished species catch projections available for the California halibut trawl fishery. However, 0.1 mt of bocaccio, 0.1 mt of canary rockfish, and 2.0 mt of lingcod were projected to be taken by all gears targeting California halibut. No overfished species catch was projected for the HMS line gear fisheries for 2005.

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.

Overfished species interactions in the directed groundfish fisheries were projected to include bocaccio, canary rockfish, cowcod, darkblotched rockfish, lingcod, POP and yelloweye rockfish. Gear specific overfished species catch projections were not available for the directed OA gears. Though gear specific overfished species catch projections were not available for the California halibut trawl fishery, 0.1 mt of bocaccio, 0.1 mt of canary rockfish, and 2.0 mt of lingcod were projected to be taken by all gears targeting California halibut. For 2005, salmon troll vessels were projected to take 0.2 mt of bocaccio, 1.6 mt of canary rockfish, 0.3 mt of lingcod, 0.4 mt of widow rockfish, and 0.2 mt of yelloweye rockfish.

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, HMS net and other legal groundfish 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 25 vessels per year landed groundfish while fishing for HMS with gill, set, drift or trammel 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 under this alternative are the same as those under alternative 5B, because no overfished species were projected to be taken in the HMS line gear fisheries or the Dungeness crab pot gear fishery for 2005.

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 5B and 6A. Data on the overfished species impacts for salmon troll vessel are not available for north and south of 40°10' N. lat. to more fully assess the changes in impacts. 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 is used to fish in the OA fishery in federal waters with a gear for which there is an RCA restriction. 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.

Less salmon troll data would be available for vessels fishing north 40°10' N. lat than would be available under alternatives 5B or 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.

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 5B and 6A. Data on the overfished species impacts for vessels under 12 feet in length are not available. 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 used longline or pot 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. Less data would be available from approximately 6 vessels that use longline gear, 2 vessels that use pot gear, and 14 vessels that use line gear.

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, 58 California halibut vessels per year and 25 HMS net vessels per year. When considering the impacts of an incidental fishery on overfished species, the HMS line fishery, the California sheephead pot fishery, the sea cucumber trawl fishery and the spot prawn trap fishery would be considered the lowest impact OA fisheries because no overfished species fishing mortality are projected for these fisheries. The fisheries with slightly greater impacts on overfished species, defined as those fisheries that take a single overfished species, which is a small amounts by weight and proportion of the available OY (less than 0.05%), are the ridgeback prawn trawl fishery with 0.1 mt of bocaccio (0.03% of the bocaccio OY), and the Dungeness crab pot fishery with 0.5 mt of lingcod (0.02% of the lingcod OY). Although the California gillnet fishery is projected to take a single overfished species, it would have a greater impact with 0.5 mt of bocaccio by weight or 0.16% of the OY being taken. It must be noted that the overfished species total catch mortality shown in table 3.3.3.6 for each fishery are based on, 2005 management measures and incidental species harvest levels. Therefore, changes in harvest levels for incidental fishery targets and bycatch management measures could be expected to result in changes to the projected catch of overfished species.

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.

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.

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 exceeds 50% of all landed catch on that trip." 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. RCA management areas defined at 660.383 (c) and adust 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 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 the non-trawl and trawl RCAs, the projected rate at which overfished species, particularly overfished shelf species, are encountered by vessels in federal waters fishing pursuant to the harvest guidelines, quotas, and other management measures governing the OA fishery could be expected to increase. Therefore, to prevent the overfished species OY from being exceeded, more restrictive trip limits would need to be adopted for the directed and incidental OA fisheries. If projections show that trip limits alone do not keep the total catch of overfished species withing the specified OY, harvest guidelines or allocations, additional measures such as closed seasons would need to be used.

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 targeting HMS with purse seine gear, and those targeting the gillnet complex (California halibut, white sea bass, sharks, and white croaker) with driftnet.

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 veiwing 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
Longline -groundfish directed			
2000	305	410	1,818,898
2001	324	398	1,690,165
2002	263	352	1,370,175
2003	296	479	1,730,461
2004	222	444	1,411,191
5-year average	*282*	*417*	*1,604,178*
Longline - Pacific Halibut directed			
2000	39 (61)	2.2	8,915
2001	35 (70)	1.9	5,956
2002	42 (73)	2.5	7,288
2003	38 (63)	4.9	21,694
2004	34 (59)	9.2	28,920
5-year average	*38 (65)*	*4.1*	*14,555*
Longline - CA Halibut directed			
2000	5 (10)	0.2	$501
2001	1 (8)	c	c
2002	2 (14)	c	c
2003	2 (6)	c	c
2004	2 (7)	c	c
5-year average	2 (9)	c	c
Pot - groundfish directed			
2000	154	183	987,706
2001	140	182	986,069
2002	139	183	984,756
2003	149	186	997,578
2004	143	183	987,646
5-year average	*145*	*183*	*988,751*
Pot - Dungeness crab directed			
2000	33 (792)	0.6	2,112
2001	25 (781)	0.2	744
2002	23 (783)	0.3	1,143
2003	17 (816)	0.3	868
2004	6 (835)	0.2	652
5-year average	*21 (801)*	0.3	*1,104*
Pot - prawn directed			
2000	9 (36)	c	225
2001	7 (37)	0.3	1,408
2002	4 (27)	0.3	2,435
2003	6 (20)	0.1	677
2004	3 (21)	c	c
5-year average	*6 (28)*	*0.1*	949
Pot - sheephead directed			
2000	21 (103)	2.0	20,676
2001	26 (81)	3.8	37,496
2002	28 (74)	0.7	5,747
2003	14 (50)	0.3	1,784
2004	16 (32)	0.8	7,088
5-year average	*21 (68)*	*1.5*	*14,558*

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
Trawl - sea cucumber directed			
2000	0 (16)	c	c
2001	2 (13)	c	c
2002	2 (14)	c	c
2003	1 (14)	c	c
2004	1 (13)	c	c
5-year average	*2 (14)*	*c*	*c*
Trawl - CA halibut directed			
2000	22 (42)	2.4	5,449
2001	33 (46)	5.9	10,505
2002	29 (49)	6.0	13,018
2003	17 (42)	1.0	1,886
2004	13 (19)	12.3	35,637
5-year average	*23 (40)*	*5.5*	*13,299*
Trawl - spot prawn directed			
2000	10 (25)	0.6	1,065
2001	9 (24)	0.5	1,038
2002	9 (25)	0.6	1,198
2003	1 (6)	c	48
2004	0 (4)	0.0	0
5-year average	*7 (17)*	0.4	837
Trawl -Ridgeback Prawn directed			
2000	22 (35)	5.1	8,939
2001	16 (23)	3.9	6,182
2002	12 (25)	0.8	767
2003	12 (23)	1.6	2,072
2004	5 (11)	0.4	564
5-year average	*13 (23)*	*2.4*	*3,705*
Trawl -Pink Shrimp directed			
2000	62 (67)	142	203,664
2001	51 (62	89	129,326
2002	44 (53)	45	61,359
2003	6 (44)	1	817
2004	4 (43)	0	74
5-year average	*33 (54)*	*55*	*79,048*
Line gear - all groundfish			
2000	760	462	2,461,956
2001	635	501	2,545,790
2002	576	522	2,735,646
2003	501	404	1,963,033
2004	476	457	2,503,500
5-year average	*590*	*469*	*2,441,985*
Line gear - CA halibut			
2000	69 (230)	1.4	4,716
2001	69 (237)	1.4	5,985
2002	58 (231)	1.1	3,674
2003	47 (259)	1.5	6,254
2004	45 (240)	2.0	7,742
5-year average	*58 (239)*	1.5	*5,674*

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
Line gear - Salmon troll (coastwide)			
2000	281 (1,076)	15	26,073
2001	243 (1,058)	11	17,960
2002	207 (1,085)	7	12,707
2003	202 (1,043)	6	11,053
2004	237 (1,234)	11	19,816
5-year average	*234 (1,099)*	*10*	*17,522*
Line gear - Salmon troll (north only)			
2000	212	14	23,654
2001	228	9	15,158
2002	148	8	12,374
2003	134	4	7,574
2004	157	7	13,046
5-year average	*176*	*8*	*14,361*
Line gear - HMS			
2000			
2001	18 (220)	0.4	1,319
2002	12 (238	0.3	1,102
2003	7 (211)	0.3	652
2004	5 (187)	0.1	396
	6 (145)	0.1	236
5-year average			
	10 (200)	*0.2*	741
Net gear - HMS			
2000	33 (193)	1.5	2,099
2001	27 (167)	1.3	2,329
2002	26 (129)	1.6	3,200
2003	20 (123)	--	22
2004	19 (103)	1.1	2,577
5-year average	25 (143)	1.1	2,045

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

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.

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

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. Table 3.3.3.5 shows historical landings of overfished species in the OA fishery relative to all OA and LE catch. Table 3.3.3.5 is based on data that were collected prior to implementation of RCAs and prior to the state requirements regarding the use of finfish excluders on vessels targeting pink shrimp.

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 3.3.3.6.

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% is projected to be taken of the remaining overfished species: 4.28% of the lingcod OY, 4.23% 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 projected to be taken in the OA fisheries. 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. Of the total OA projected take of overfished species, 80%of the widow rockfish is projected to be taken in the pink shrimp, XXXsalmon troll, **and Pacific halibut fisheries, and 73% of the yelloweye rockfish is projected to be taken in the pink** shrimp, **salmon troll, and Pacific halibut fisheriesXXX.**

When considering the impacts of an incidental fishery on overfished species, the HMS line fishery, the California sheephead pot fishery, the sea cucumber trawl fishery and the spot prawn trap fishery, would be considered the lowest impact OA fisheries because no overfished species fishing mortality are projected for these fisheries. The fisheries with slightly greater 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%) are: the ridgeback prawn trawl fishery with 0.1 mt of bocaccio (0.03% of the bocaccio OY), and the Dungeness crab pot fishery with 0.5 mt of lingcod (0.02% of the lingcod OY). Although the California gillnet fishery is projected to take a single overfished species, it would have a greater impact than these other fisheries with 0.5 mt of bocaccio by weight or 0.16% of the OY being taken. It must be noted that the overfished species total catch mortalities shown in Table 3.3.3.6 for each fishery are based on, 2005 management measures and incidental species harvest levels. Therefore, changes in harvest levels for incidental fishery targets and bycatch management measures could be expected to result in changes to the projected catch of overfished species.

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.

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 1.92% of the yelloweye rockfish OY and **XXXXXcanary & lingcodXXX**. 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 Historical landings of overfished species by commercial fishers prior to the implementation of RCAs and state requirements for finfish excluders on pink shrimp vessels, 1999-2001 (Extracted from table 6-14 DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery)

	1999		2000		2001	
	OA landed catch (mt)	OA & LE landed catch (mt)	OA landed catch (mt)	OA & LE landed catch (mt)	OA landed catch (mt)	OA & LE landed catch (mt)
Bocaccio	Non-shrimp-22.8 Shrimp-0.2 Total-23.0	58.5 (40% OA)	Non-shrimp-5.9 Shrimp-0.0 Total- 5.9	24.6 (24% OA)	Non-shrimp-6.4 Shrimp-0.1 Total- 6.5	22.8 (3.5% OA)
Canary rockfish	Non-shrimp-56.6 Shrimp-21.3 Total- 77.9	642.2 (12% OA)	Non-shrimp-5.0 Shrimp-7.2 Total-12.2	55.8 (22% OA)	Non-shrimp-2.8 Shrimp-2.0 Total- 4.8	36.2 (13% OA)
Cowcod	Non-shrimp-2.2 Shrimp-0.2 Total- 2.4	6.5 (37% OA)	Non-shrimp-0.4 Shrimp-0.1 Total- 0.5	2.4 (21% OA)	Non-shrimp-0.0 Shrimp-0.0 Total- 0.0	0.8 (0% OA)
Darkblotched rockfish	Non-shrimp-0.1 Shrimp-2.0 Total- 2.1	284.3 (0.7% OA)	Non-shrimp-0.5 Shrimp-0.0 Total- 0.5	218.8 (0.2% OA)	Non-shrimp-0.2 Shrimp-0.0 Total- 0.2	143.1 (0.1% OA)
Lingcod	Non-shrimp-84.7 Shrimp-17.5 Total- 102.2	354.5 (29% OA)	Non-shrimp-49.0 Shrimp-9.1 Total- 58.1	143.5 (40% OA)	Non-shrimp-63.5 Shrimp-5.5 Total- 69	147.8 (47% OA)
POP	Non-shrimp-0.2 Shrimp-0.1 Total- 0.3	481.8 (0% OA)	Non-shrimp-0.0 Shrimp-0.1 Total- 0.1	140.6 (0% OA)	Non-shrimp-0.0 Shrimp-0.0 Total- 0.0	187.6 (0% OA)
Widow rockfish	Non-shrimp-41.4 Shrimp-4.6 Total- 46	3,903.5 (1% OA)	Non-shrimp-17.7 Shrimp-1.7 Total- 19.4	3,787.5 (0.5% OA)	Non-shrimp-13.0 Shrimp-0.6 Total- 13.6	1,765 (0.8% OA)
Yelloweye rockfish	Total-15.4	83.5 (18% OA)	Total- 2.9	8.95 (32% OA)	Total- 2.9	12.0 (24% OA)

Table 3.3.3.7 Total catch projections of overfished species in the 2005 open access fisheries. (9/1/2005 GMT's best estimates of total mortality as a result of June 2005 inseason adjustments)

	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	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	X0.0X	0.0	0.0	XX	0.0	0.0	X0.5X
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	X0.3X	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	103.3	0.1	0.5	1.1
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%	4.28%	0.02%	0.18%	4.23%

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.

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 in 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 Many fishers catch groundfish incidentally when targeting other species, because of the kind of gear they use and the co-occurrence of target and groundfish species in a given area. Fisheries targeting Pacific halibut, California halibut, Dungeness crab, spot prawn, ridgeback prawn, California Sheephead, sea cucumber, pink shrimp, salmon and HMS comprise most of the incidental segments of the OA fishery. For the purpose of this EA vessels have been classified as being in the OA incidental fishery if groundfish comprises 50% or less of their landings, measured by dollar value. 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.

The incidental OA fisheries may also account for substantial amounts of bycatch (incidental catch which is not landed), especially for overfished groundfish species. The amount of bycatch of a particular overfished species in an incidental groundfish fishery would depend on the areas fished and the vulnerability of the overfished species to the type of gear that is used. Fishing mortality rates resulting from the fishing activity may vary considerably between the gears and fisheries. The weight of OA landings by depth group (nearshore, shelf, pelagic, and slope) are shown inTable 3.3.3.8 for each of the incidental groundfish fisheries for the years 2000-2004.

Deeper slope species such as darkblotched rockfish and POP, and pelagic shelf species such as widow rockfish, are more vulnerable to LE trawl gear, and have been taken in smaller proportions in the OA fishery. The non-groundfish trawl fisheries (pink shrimp trawl, spot prawn 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. With the exception of the pink shrimp fishery, which historically had landed slope species until 2003, when finfish excluders began to be widely used.

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: the 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	--

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		10 (7,538)
>1,000	--	1 (8,629)	--		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)

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 - 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)	--	--	--
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	--	--	--	X
2002													
<100 lb	--	--	--	--	--	20	20	--	--	--	--	--	34
101-200 lb	--	--	--	--	--	3	5	--	--	--	--	--	8
>200 lb	--	--	--	--	--	7	3	--	--	--	--	--	X
2003													
<100 lb	--	--	--	--	--	16	8	2	--	--	--	--	25
101-200 lb	--	--	--	--	--	4	9	3	--	--	--	--	13
>200 lb	--	--	--	--	--	2	8	10	--	--	--	--	X
2004													
<100 lb	--	--	--	--	--	11	8	1	--	--	--	--	17
101-200 lb	--	--	--	--	--	5	7	--	--	--	--	--	11
>200 lb	--	--	--	--	--	19	17	2	--	--	--	--	X
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	1	--	--	--	--	--	--	--	--	--	--	--	2
2004													
<100 lb	--	1	1	1	2	--	--	--	--	--	--	--	5
101-200 lb	--	1	1	--	--	--	--	--	--	--	--	--	2
>200 lb	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	--	X
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	--	--	--	--	--	--	--	--	--	--	X
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	X
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	X
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	X
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	--	X
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	X

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	
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	X
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	X
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	--	--	--	--	--	--	--	X
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	--	--	--	--	--	--	--	X
2004													
<100 lb	3	--	1	1	--	--	--	--	--	2	--	--	4
101-200 lb	1	1	--	--	--	--	--	--	--	1	1	--	2
>200 lb	--	--	--	--	--	--	--	--	--	1	1	1	X
Trawl -Pink Shrimp													
2000													
<100 lb	--	--	--	--	8	7	7	11	6	9	--	--	34
101-200 lb	--	--	--	3	7	23	13	17	16	16	--	--	43
>200 lb	--	--	--	1	12	100	134	86	94	43	--	--	X
2001													
<100 lb	--	--	--	14	13	10	13	8	7	10	--	--	39
101-200 lb	--	--	--	17	15	15	21	20	14	6	--	--	38
>200 lb	--	--	--	41	58	86	74	24	12	2	--	--	X
2002													
<100 lb	--	--	--	17	10	7	9	5	5	3	--	--	31
101-200 lb	--	--	--	9	20	15	2	5	2	3	--	--	28
>200 lb	--	--	--	12	71	61	7	6	3	3	--	--	X
2003													
<100 lb	--	--	--	2	3	2	1	1	--	2	--	--	5
101-200 lb	--	--	--	1	--	--	--	--	1	1	--	--	2
>200 lb	--	--	--	--	2	1	--	--	1	1	--	--	X
2004													
<100 lb	--	--	--	--	--	1	--	1	--	--	--	--	2
101-200 lb	--	--	--	--	1	2	--	--	--	--	--	--	2
>200 lb	--	--	--	--	3	1	3	1	--	--	--	--	X

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	--	--	--	--	X
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	--	--	--	X
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	--	--	--	X
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	--	--	--	X
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	--	--	--	X
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	--	--	X
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 (46° 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]

[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.

According to PacFIN data, the number of unique companies buying groundfish along the West Coast has 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 1,536 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 25 HMS vessels using net gear; and X vessels using other OA gears 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 1,536 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 1,478 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 1,514 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 1,416 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 1,416 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 1,108 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, 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 1,108 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.

<u>Indirect impacts</u> 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 1,536 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 25 HMS vessels using net gear; and X **vessels using other OA gears** 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 1,416 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 1,108 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, 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 1,536 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 25 HMS vessels using net gear; and X vessels using other OA gears 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 1,536 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. 1,478 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. 1,514 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 1,416 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 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 1,416 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 1,108 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, 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 1,108 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 1,536 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 25 HMS vessels using net gear; and X vessels using other OA gears 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 1,416 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, 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 1,108 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, 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 1,536 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 25 HMS vessels using net gear; and X vessels using other OA gears. 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 1,416: 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, 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 1,416 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 1,108 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, 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 1,108 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 XX8 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, 1,536 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 1,478 vessels annually, 58 fewer than does Alternative 6A. Alternative 7 is essentially the same as Alternative 6A, 1,514 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 1,416 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, 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 1,108 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, 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 halibutt, 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 1,536 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); 25 HMS vessels using net gear; and X vessels using other OA gears. 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 1,536 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 1,416 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, 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 1,416. 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
<u>Alternative 9</u> Directed vessels. those that land more than 500 lb of groundfish in a calendar year.	<u>Direct impact</u> Includes data from 1,108 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, 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. <u>Indirect impact</u> Increased position and effort data from 1,108. 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.
<u>Alternative 10</u> No Action. No VMS requirements. Discontinue the use of RCA management and adust trip limits and seasons accordingly.	<u>Direct impact</u> 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. <u>Indirect impact</u> 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. Altenatives 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 1,536 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; 25 vessels using net gear; and X vessels using other OA gears. 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 1,416 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, 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 1,108 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, 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 $486,224 - $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 $2,138,112 - $6,958,080 year 1, $294,912 - $1,121,280 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 $2,231,780 - $1, 6,778,108 in year 1, $2,057,376 - $6,695,340 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 $2,107,488 - $6,858,420 year 1, $290,688 - $1,105,220 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 $1,971,072 - $6,414,480 year 1, $271,872 - $1,033,680 in subsequent years. Greater flexibility in the use of management rules with geographical areas for the 1,416 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, 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 $1,542,336 - $5,019,240 year 1, $212,736 - $808,840 in subsequent years. Greater flexibility in the use of management rules with geographical areas for the 1,108 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, 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 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 4.3.3.4.). 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 4.3.3.4).

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.

<u>VMS transceiver unit</u> 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 4.3.3.4). 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 4.3.3.4. 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 4.3.3.4).

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

		Cost to the fleet for VMS		
Open access gear group	Average annual no. of vessels landing groundfish, 2000-2003	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
Longline - Pacific Halibut directed	65	$78,000 -$175,500 ($247,000)	$20,150 - $51,090 9	$12,480 -$47,450
Longline - CA Halibut	2	$2,400 -$5,400 ($7,600)	$620 - $1,572	$384 -$1,460
Pot - groundfish directed	145	$174,000 - $391,500 ($551,000)	$44,950 - $113,970	$27,840 -$105,850
Pot - Dungeness crab	21	$25,200 - $56,700 ($79,800)	$6,510 - $16,506	$4,032 -$15,330
Pot - prawn/shrimp	6	$7,200 - $16,200 ($22,800)	$1,860 - $4,716	$1,152 -$4,380
Pot - sheephead	21	$25,200 - $56,700 ($79,800)	$6,510 - $16,506	$4,032 -$15,330
Trawl - CA Halibut g/	40	$48,000 -$108,000 ($152,000)	$12,400 - $31,440	$7,680 -$29,200
Trawl - Sea Cucumber	14	$16,800 - $37,800 ($53,200)	$4,340 - $11,004	$2,688 -$10,220
Trawl - Ridgeback Prawn	23	$27,600 - $62,100 ($87,400)	$7,130 - $18,078	$4,416 -$16,790
Trawl - Pink Shrimp	54	$64,800 - $145,800 ($205,200)	$16,740 - $42,444	$10,368 -$39,420
Line gear - groundfish directed	590	$708,000 - $1,53,000 ($2,242,000)	$182,900 - $463,740	$113,280 -$430,700
Line gear - CA halibut directed	58	$69,600 - $156,600 ($220,400)	$17,980 - $45,588	$11,136 -$42,340
Line gear - HMS	10	$12,000 - $27,000 ($38,000)	$3,100 - $7,860	$1,920 -$7,300
Line gear - Salmon troll (coastwide)	234	$280,800 - $631,800 ($889,200)	$72,540 - $183,924	$44,928 -$170,820
Line gear - Salmon troll (north only)	176	$211,200 - $475,200 ($668,800)	$54,560 - $138,336	$33,792 -$128,480
Net gear - HMS	25	$30,000 - $67,500 ($95,000)	$7,750 - $19,650	$4,800 -$18,250
Other gears	X			

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.

Table 4.3.3.4. Estimated burden, per vessel, for the VMS monitoring systems

	Alternative 1 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 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)

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. Though it is difficult to know all of the reasons why any one individual fisher would make a particular decision, is assumed that vessels with the lowest profit margin will likely exit the groundfish fishery and not incur the costs associated with VMS. Table 4.3.3.5 show by target fishery and gear, the number of vessels in a range of assumed profit margins categories. 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. Understanding the level of dependency that participants in this fishery have on groundfish should be considered in light of their overall fisheries revenues.

INSERT ECONOMIC DISCUSSION REGARDING
VESSELS THAT MAY DECIDE TO LEAVE THE FISHERY

Table 4.3.3.5 The number of vessels by assumed profit margins for OA incidental fisheries vessels by gears, 2000-2004

Gear	Assumed Profit Margin				
Longline	7.5%	10%	15%	20%	30%
Pacific Halibut 2000 2001 2001 2003 2004					
California Halibut 2000 2001 2001 2003 2004					
Pot	7.5%	10%	15%	20%	30%
Dungeness crab 2000 2001 2001 2003 2004					
Prawn 2000 2001 2001 2003 2004					
California Sheephead 2000 2001 2001 2003 2004					
Trawl	7.5%	10%	15%	20%	30%
Ridgeback prawn 2000 2001 2001 2003 2004					
Sea cucumber 2000 2001 2001 2003 2004					
California halibut 2000 2001 2001 2003 2004					

Line	7.5%	10%	15%	20%	30%
HMS 2000 2001 2001 2003 2004					
Salmon troll (coastwide) 2000 2001 2001 2003 2004					
California halibut 2000 2001 2001 2003 2004					
Net	**7.5%**	**10%**	**15%**	**20%**	**30%**
CPS 2000 2001 2001 2003 2004					
Other gears	**7.5%**	**10%**	**15%**	**20%**	**30%**
Mixed 2000 2001 2001 2003 2004					

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

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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 - Pacific Halibut					
2000					
2001					
2002					
2003					
4-year average					
Longline - CA Halibut					
2000	68	1	--	--	--
2001	66	3	--	--	--
2002	58	--	--	--	--
2003	43	3	--	--	1
2004	40	4	--	1	--
5-year average					
Pot - Dungeness crab					
2000	32	1	--	--	--
2001	24	1	--	--	--
2002	22	1	--	--	--
2003	16	1	--	--	--
2004	5	1	--	--	--
Pot - prawn/shrimp					
2000					
2001					
2002					
2003					
4-year average					
Pot - sheephead					
2000					
2001					
2002					
2003					
4-year average					
Trawl - sea cucumber					
2000	--	--	--	--	--
2001	2	--	--	--	--
2002	2	--	--	--	--
2003	1	--	--	--	--
2004	1	--	--	--	--

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
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		--	1	--	--
Line gear - CA halibut					
2000					
2001					
2002					
2003					
4-year average					
Line gear - HMS					
2000	18	--	--	--	--
2001	12	--	--	--	--
2002	7	--	--	--	--
2003	3	2	--	--	--
2004	5	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	--	--	--
Line gear - Salmon troll (north only)					
2000	209	3	--	--	--
2001	228	--	--	--	--
2002	143	5	--	--	--
2003	133	1	--	--	--
2004	155	2	--	--	--
Net gear - HMS					
2000					
2001					
2002					
2003					
2004					

Open access gear group	Number of open access vessels by groundfish exvessel revenue group				
	$0-$500	$501-$1000	$1001-$1500	$1501-$2000	>$2000
Other gears 2000 2001 2002 2003 2004					
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 Under each of the Alternatives 2-9, Vessels with assumed profit margins from groundfish that XXXXXXXXXXXXXX would likely leave the fishery.

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 \$486,224 - \$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, 1,536 vessels. The estimated purchase cost of VMS services to the fishing industry if all vessels remain in the fishery is $2,138,112 - $6,958,080 year 1, $294,912 - $1,121,280 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 $2,231,780 - $1, 6,778,108 in year 1, $2,057,376 - $6,695,340 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 $2,107,488 - $6,858,420 year 1, $290,688 - $1,105,220 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 1,416 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, 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 $1,971,072 - $6,414,480 year 1, $271,872 - $1,033,680 in subsequent years

Under Alternative 9 data from 1,108 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, 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 $1,542,336 - $5,019,240 year 1, $212,736 - $808,840 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. XXXtake **excerpt from 2003 spex EIS regarding possible trip limitsXXXX**

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 1,536 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); 25 HMS vessels using net gear; and X vessels using other OA gears. 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 1,416 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, 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 1,108 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, 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 1,416 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, 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 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.

than 500 lb of groundfish in a calendar year, it includes fewer nongroundfish trawl vessels than Alterative 8. Under alternative 9 data from 1,108 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, 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

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.

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) <u>A description of the reasons why the action by the agency is being considered</u>.

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

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

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.

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

CDFG. 2001. California Marine Living Resources: A Status Report, December 2001. Sacramento, California. (Available on-line: www.dfg.ca.gov/mrd/status).

Eschmeyer, W. N., E. S. Herald, et al. 1983. A Field Guide to Pacific Coast Fishes of North America. Boston, Houghton Mifflin.

Hastie, J. 2001. Evaluation of bycatch and discard in the West Coast groundfish fishery. Portland, OR, Unpublished report prepared for the Pacific Fishery Management Council.

Kramer, S. H., J. S. Sunada, et al. (2001). California Halibut. California's Living Marine Resources: A Status Report. W. S. Leet, C. M. Dewees, R. Klingbeil and E. J. Larson. Davis, CA, California Sea Grant Program: 195-198.

Larson, M. F. 2001. Spot Prawn. California's Living Marine Resources: A Status Report. W. S. Leet, C. M. Dewees, R. Klingbeil and E. J. Larson. Davis, CA, California Sea Grant Program: 121-123.

Parker, D. and P. Kalvass. 1992 Sea Urchins. IN California's Living Marine Resources and Their Utilization, IN University of California Cooperative Extension. 1995. Sea Urchins. Sea Grant Extension Program Publication.

PFMC. 1998. Final environmental assessment/regulatory impact review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan. Pacific Fishery Management Council, Portland, OR, October 1998.

PFMC. 2003. Fishery management plan and environmental impact statement for U.S. West Coast highly migratory species [Final environmental impact statement]. Pacific Fishery Management Council, Portland, OR, August 2003.

PFMC 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for 2005-2006 for the Pacific Coast Groundfish Fishery. Pacific Fishery Management Council, Portland, OR, August 2004

Robinson, M. K. 2000. Summary of the 2000 trial purse seine fishery for Pacific sardine (Sadinops sagax). Montesano, WA, Washington Department of Fish and Wildlife: 15.

Rogers-Bennett, L. and D. S. Ono. 2001. Sea Cucumbers. California's Living Marine Resources: A Status Report. W. S. Leet, C. M. Dewees, R. Klingbeil and E. J. Larson. Davis, CA, California Sea Grant Program: 131-134.

Sunada, J. S., J. B. Richards, et al. 2001. Ridgeback Prawn. California's Living Marine Resources: A Status Report. W. S. Leet, C. M. Dewees, R. Klingbeil and E. J. Larson. Davis, CA, California Sea Grant Program: 124-126.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

SEP -1 2005

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PFMC

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

Dear ~~Mr. Hansen~~ Don:

I am pleased to announce the release of our 2004 Annual Report to Congress and the Councils on the Status of U.S. Fisheries and have enclosed three copies of the report. The report is available online at: http://www.nmfs.noaa.gov/sfa/reports.htm.

Compared to the 2003 report, I note that *Pacific whiting* is no longer overfished and the biomass has fully rebuilt. In addition, two stocks, *lingcod* and *Pacific ocean perch*, are no longer overfished. These are very positive results and I look forward to full rebuilding of the *lingcod* and *Pacific ocean perch* stocks.

The 2004 Status of U.S. Fisheries report lists new determinations for two stocks managed by the Pacific Council. *Skipjack tuna - Eastern Pacific* is not subject to overfishing and in not overfished. *Cabezon* is not overfished. New stock assessments that allow a change in status from 'unknown' to 'known' is an important step in improving management of these species. I am pleased that the new determinations for these two stocks are positive.

As you know, two stocks managed by the Pacific Council, *shortspine thornyhead* and *black rockfish – North*, were determined to be subject to overfishing. Management measures already adopted are expected to end overfishing. Nonetheless, I encourage the Council to closely monitor fishing mortality on these stocks and quickly take further management action to prevent overfishing, if needed.

I appreciate the commitment of the Pacific Fishery Management Council to end overfishing and rebuild overfished stocks and I am confident that NMFS and the Council can work together to achieve these goals.

Sincerely,

Bill

William T. Hogarth, Ph.D.

SUSTAINING AND REBUILDING

NATIONAL MARINE FISHERIES SERVICE
2004 REPORT TO CONGRESS
THE STATUS OF U.S. FISHERIES

As mandated by the Sustainable Fisheries Act amendments to the Magnuson-Stevens Fishery Conservation and Management Act of 1996

August 2005

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Sustainable Fisheries

An online version of this report is available at
http://www.nmfs.noaa.gov/sfa/reports.html

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A MESSAGE FROM THE NOAA ASSISTANT ADMINISTRATOR FOR FISHERIES

Welcome to NOAA's National Marine Fisheries Service's report on the status of the U.S. fisheries for 2004

This report presents the status of U.S. marine fish stocks for 2004. Ending overfishing and rebuilding stocks to the level that provides maximum sustainable yield is a high priority for NOAA's National Marine Fisheries Service (NMFS) and the eight regional Fishery Management Councils (Councils). Together, we are dedicated to achieving the goal of sustainable fisheries envisioned by the Congress in the Sustainable Fisheries Act of 1996.

This report documents status changes for previously assessed stocks and new determinations for stocks assessed for the first time in 2004.

NMFS has increased the number of assessed stocks over the last several years, and this trend will continue. In 2004, NMFS completed 84 stock assessments, of which 10 were for stocks not previously assessed. Stock assessments are the foundation for sustainable U.S. marine fisheries management. These assessments provide the information to determine if the proportion of a stock taken by a fishery is too high (overfishing) or the biomass of a stock is too low (overfished).

Overall, 81% of the stocks and stock complexes with known status are not subject to overfishing, and 72% of the stocks and stock complexes with known status are not overfished. For stocks that transitioned from an unknown status to known, 87% are not subject to overfishing and 78% are not overfished. It is important to note that appropriate management measures can end overfishing quickly, but subsequent rebuilding of the stock takes time for reproduction and growth to result in increased biomass.

We approved 5 fishery management plan amendments in 2004 to implement final rebuilding plans for 23 stocks in the Northeast, Southeast, Northwest, and Alaska regions. This is a significant accomplishment, establishing new management measures to rebuild these stocks.

The following is a brief summary of how the status of our marine fisheries changed in 2004:

One stock, *Pacific whiting,* has been fully rebuilt, and overfishing is no longer occurring. This highly productive west coast groundfish stock rebuilt very quickly following a 2002 determination that the biomass had declined below the overfished threshold.

Mid-Atlantic *black sea bass* is no longer overfished, and overfishing has ended. Three more stocks have increased in abundance to the point they are no longer overfished (*lingcod, pacific ocean perch, and king mackerel – Gulf group)*. Rebuilding measures for all these stocks will continue until each stock has fully rebuilt to the level that provides maximum sustainable yield. Additionally, *Gulf of Mexico red drum* is no longer subject to overfishing.

Three previously assessed stocks were determined to be overfished. Two of these are Alaska crab stocks which already have rebuilding plans and fishing is not allowed. The third stock is *butterfish,* and rebuilding measures are being developed.

Seven stocks or stock complexes were determined to be subject to overfishing (*Atlantic sea scallop, summer flounder, Gulf of Mexico greater amberjack, shortspine thornyhead, black rockfish – North, Hawaii bottomfish complex, and large coastal sharks*). Appropriate management measures will be implemented to lower the fishing mortality rate for these stocks or complexes.

A majority of our assessed fish stocks are not overfished or subject to overfishing. However, NMFS and the Councils will continue working toward the goal of rebuilding all stocks and maintaining them at highly productive levels. We also are committed to increasing the number of stocks that are assessed.

We will face challenges - the natural environment is unpredictable; management measures may not always work as planned; and as new information about a stock becomes available it may alter our view of its potential yield and status. We are addressing these challenges and will continue to improve the status of U.S. marine fisheries.

William T. Hogarth

William T. Hogarth, Ph.D.

Introduction

This report describes the state of our nation's marine fisheries and the effectiveness of fisheries management under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as amended in 1996 by the Sustainable Fisheries Act (SFA). The SFA emphasized the need to end overfishing, rebuild overfished stocks, and establish management plans designed to ensure biologically and economically sustainable fisheries. A stock above an established fishing mortality (harvest) rate is said to be subject to overfishing. A stock below its prescribed biological threshold is considered overfished.

Significant progress continues in our scientific knowledge of marine fisheries and our ability to use that knowledge to manage the sustained use of the Nation's marine fish resources. This report is prepared annually in response to a Congressional requirement to report on the status of marine fisheries within each Council's geographic area of authority and to identify those fisheries overfished or approaching an overfished condition.

> **"The Secretary shall report annually to the Congress and the councils on the status of fisheries within each council's geographic area of authority and identify those fisheries that are overfished or are approaching a condition of being overfished."**
>
> *-Section 304(e)(1) of the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996*

This report identifies managed marine fish stocks in the U.S. Exclusive Economic Zone[1], including stocks that straddle international boundaries and highly migratory stocks. In response to the Congressional requirement, the report categorizes stocks according to their individual status. The report also provides answers to four questions to help gauge the effectiveness of management measures designed to meet the provisions of the SFA:

1. *What stocks are subject to overfishing?*
2. *What stocks are overfished?*
3. *What stocks are approaching an overfished condition?*
4. *How do this year's determinations compare to previous years?*

Using the Best Available Data

To categorize marine fish stocks for this report, NMFS reviewed each stock relative to the status determination criteria (SDC) contained in the relevant fishery management plan (FMP). Sometimes the SDC do not apply to each individual stock, but rather are applied broadly to a group of similar species harvested together or sharing a similar life history. These groups are referred

[1] The U.S. Exclusive Economic Zone extends from 3 to 200 miles offshore and covers more than 2 million square miles.

to as "stock complexes" or assemblages and may be particularly useful when data are sparse or lacking. A stock complex is measured either against the SDC for its proxy stock or against the complex as a whole, depending on the data and assessment tools available to the scientists. For the first time, this years' report includes these stock complexes, rather than listing species individually.

Based on a review of the best scientific information available against the SDC for each stock or stock complex, NMFS determined the overfishing and overfished condition, including whether or not it is approaching an overfished condition. NMFS used many resources to make these determinations, including final, peer-reviewed documents such as Stock Assessment Review Committee reports and recommendations of each Council's Scientific and Statistical Committee. For species not included in a federal FMP (i.e., species managed by international agreement), the stock status determination was made using other official sources of information, as adopted in accordance with the relevant FMP.

Determinations

Overfished - A stock size that is below a prescribed biomass threshold

Overfishing - Harvesting at a rate above a prescribed fishing mortality threshold

Approaching Overfished Condition - Based on trends in harvesting effort, fishery resource size, and other appropriate factors, it is estimated that the fishery will become overfished within 2 years

More information on stock complexes and the methodology used to include them in this report can be found in Appendix 1 located on the NMFS website. Stock complexes are used in the Pacific Islands and the Alaska Regions, as well as by the NMFS Atlantic Highly Migratory Species (HMS) division.

Changes to Determinations

This report is based on assessments completed as of December 31, 2004. Results from fishery stock assessments in progress on December 31, 2004 will be captured in next year's report. Changes in status determinations from 2003 to 2004 appear in Table 1 below. These changes are fully illustrated in Tables 10 and 11 at the end of this report.

Table 1. Changes in Status Determinations from 2003 to 2004 in number of stocks. "Known to known" means the stock had a known determination in 2003 and 2004. "Unknown to Known" means the stock was listed in 2003 as "unknown" and in 2004 has a known determination.

Status Category in 2004	Known to known	Unknown to known	Total
Overfishing	5	2	7
Not overfishing	3	13	16
Overfished	3	2	5
Not overfished	6	7	13

The MSA requires action to end overfishing and to develop rebuilding plans for overfished stocks. A summary of the management actions, where required, is listed below for those stocks with new overfished and overfishing determinations.

Management action is being taken on the seven stocks newly listed as subject to overfishing.

- The *Atlantic sea scallop* stock is currently at a high biomass level. The New England Fishery Management Council implemented measures for the 2005 fishing year, starting March 1, 2005, including revised access area trip and days-at-sea allocations, implementation of the Georges Bank Closed Area Access Program in full, that are expected to eliminate overfishing for this stock.
- *Summer flounder* is a rebuilding stock that continues to increase in biomass. The stock size is at the highest level in the past 25 years but is not yet fully rebuilt. The most recent assessment determined that overfishing is occurring for this stock. The Mid-Atlantic Fishery Management Council was notified of the change in status for this stock on May 11, 2005. The Council will recommend action to reduce the fishing mortality rate and end overfishing as part of their annual specification setting process.
- *Shortspine thornyhead* was determined to be subject to overfishing in 2004 following analysis of 2003 harvest data, since data were not yet available for the full 2004 fishing year to make a determination. The Pacific Fishery Management Council took action to prevent continued overfishing on *shortspine thornyhead*, by implementing a 35% reduction in participating vessels through a December, 2003 vessel/permit buyback program and by expanding the trawl Rockfish Conservation Area. This area now includes greater coverage of continental slope areas to provide stronger protection for overfished *darkblotched rockfish*, which co-occurs with other slope species like *shortspine thornyhead*.
- *Black rockfish - North* was determined to be subject to overfishing in 2004 following analysis of 2003 harvest data. *Black rockfish* is an abundant nearshore species targeted by commercial and recreational fisheries. Our state partner in managing *black rockfish*, Oregon, implemented a commercial license limitation program to constrain the capacity of their nearshore commercial fisheries for several rockfish species, including *black rockfish*. Further, *black rockfish* was separated out of the State's minor nearshore rockfish species complex in order to give it more targeted management, including area-specific harvest set asides that facilitated State monitoring and harvest constraints and inseason closures in their recreational fisheries.
- A March, 2005, update of data for *Gulf of Mexico greater amberjack* shows catches are close to the rebuilding levels for 2004 and only moderately over for 2003, although the overfishing level was exceeded. In response to the overfishing determination, an increase in

the target catch level for *greater amberjack* planned for 2005 was cancelled, and the stock will be assessed again in 2005 to determine if overfishing has ended or if further management measures are needed to reduce fishing mortality. The stock assessment for greater amberjack is currently underway.

- The *Bottomfish Multi-species Complex – Hawaiian Archipelago* contains up to 19 species previously listed as unknown. The Western Pacific Fishery Management Council (WPFMC) was notified on May 27, 2005, that this complex is subject to overfishing. NMFS published a notice of a control date for this fishery on July 13, 2005 (70 FR 40305). The WPFMC is currently analyzing management options to reduce fishing effort in the EEZ around the main Hawaiian Islands, and will prepare an amendment to the Bottomfish and Seamount Groundfish FMP.
- The assessment for the *Large Coastal Shark Complex* is based on 22 stocks. Management of this complex includes measures to reduce fishing mortality in both the commercial (retention limits, landing restrictions, seasons, quotas, and gear restrictions) and recreational (minimum size, bag limits, and landing restrictions) sectors. An assessment of this complex's status is scheduled for 2006 to determine if these measures have successfully reduced overfishing. Further action will be taken if necessary.

Management action, as appropriate, is being taken on the five stocks newly listed as overfished.

- *Blue king crab – St Matthew Island* and *Tanner crab – Eastern Bering Sea* are in rebuilding plans and directed fisheries are closed. The biomass for both stocks is near their threshold levels. Both stocks had been declared not overfished in the 2003 report after being listed as overfished for several years. Fluctuation around the threshold level could result from environmental conditions or from variability in assessment results. Since a rebuilding plan is in place and the fisheries are closed, no further action is needed at this time.
- The Mid-Atlantic Fishery Management Council was notified of the overfished status of *Atlantic butterfish* on February 11, 2005. Management measures to rebuild this stock are under development.
- *Pelagic armorhead complex – Hancock seamount* is a complex that was previously listed only by its indicator stock, *pelagic armorhead*. This stock complex uses *pelagic armorhead* as the indicator species of a three-species seamount groundfish complex that includes *raftfish* and *alfonsin*. This stock complex does not have a formal rebuilding plan or time period for rebuilding. The fishery in the U.S. EEZ has been closed under sequential 6-year moratoria since the inception of the FMP in 1986. The current moratorium is effective until 2010. These moratoria have been treated by NMFS as a de facto rebuilding plan, and previous versions of this report referred to the cumulative period of these moratoria as the time period for rebuilding. The WPFMC is

currently considering more permanent conservation and management measures for this stock complex.

- The assessment for the *Large Coastal Shark Complex* is based on 22 stocks. Management of this complex includes measures to rebuild the stock for both the commercial (retention limits, landing restrictions, seasons, quotas, and gear restrictions) and recreational (minimum size and bag limits, and landing restrictions) sectors. An assessment of this complex's status is scheduled for 2006 to determine if these measures have resulted in rebuilding as anticipated. Further action will be taken if necessary.

The status of all 688 stocks and stock complexes is summarized in Table 2.

Overview of Overfishing in 2004[2]

- 236 stocks or stock complexes are known with respect to their overfishing status. Of these:
    - 192 stocks or stock complexes are not subject to overfishing.
    - 44 stocks or stock complexes have a fishing mortality rate that exceeds the overfishing threshold (i.e., subject to overfishing).
- 452 stocks or stock complexes have overfishing thresholds not defined or applicable, or are unknown with respect to their overfishing status.

Changes in overfishing status in 2004

Changes in overfishing status determinations for 2004 are listed below. Specific changes from 2003 to 2004 by region are found in Table 10, at the end of this report.

- In the Northeast Region -
    - *Sea scallop* is subject to overfishing.
    - *Summer flounder* is subject to overfishing.
    - *Black sea bass* is no longer subject to overfishing.
    - *Deep-sea red crab* is not subject to overfishing, having been listed previously as unknown.
- In the Southeast Region -
    - Gulf of Mexico *greater amberjack* is subject to overfishing.
    - *Gulf of Mexico red drum* is no longer subject to overfishing.
    - *Dolphin* is not subject to overfishing, having been listed previously as unknown.
    - *Cobia* is not subject to overfishing, having been listed previously as unknown.

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[2] Numbers in this section should be viewed with care, as listing by complex may impact this number. This change would be most obvious with the stock complexes in the *Atlantic Tunas, Swordfish, and Sharks FMP*. In 2003, all individual species in the complexes were assigned the determination made for the complex, without regard for whether or not that individual stock was specifically assessed. In fact, the determination was never made for all the individual species. NMFS believes the 2004 number represents a truer picture of stocks and stock complexes subject to overfishing.

- In the Southwest Region
    - *Skipjack tuna – Eastern Pacific* is not subject to overfishing. This stock was listed previously as unknown in the Pacific Islands Region.
- In the Northwest Region -
    - *Shortspine thornyhead* is subject to overfishing.
    - *Black rockfish - North* is subject to overfishing.
    - *Pacific whiting* is no longer subject to overfishing.
- In the Pacific Islands Region –
    - The *Bottomfish multi-species complex – Hawaiian archipelago* is subject to overfishing. This complex contains up to 19 species listed previously as unknown.
- In the Alaska Region –
    - *BSAI Other Rockfish* complex is not subject to overfishing. This complex contains 8 species, 6 of which were listed previously as unknown.
    - *BSAI Other Flatfish* complex is not subject to overfishing. This complex contains 12 species, all of which were listed previously as unknown.
    - *BSAI Other Species* complex is not subject to overfishing. This complex contains 63 species, 26 of which were listed previously as unknown. The remainder are newly listed.
    - *BSAI shortraker rockfish* is not subject to overfishing, having been listed previously as unknown.
    - *BSAI rougheye rockfish* is not subject to overfishing, having been listed previously as unknown.
    - *GOA Thornyhead Rockfish* complex is not subject to overfishing. This complex contains 2 species, 1 of which was listed previously as unknown.
    - *GOA Pelagic Shelf Rockfish* complex is not subject to overfishing. This complex contains 4 species, 2 of which were listed previously as unknown and 1 is newly listed.
    - *GOA Shallow Water Flatfish* complex is not subject to overfishing. This complex contains 14 species, 5 of which were listed previously as unknown.
    - *GOA Skates* complex is not subject to overfishing. This complex contains 9 species, 7 of which were listed previously as unknown.
- For the Atlantic HMS division –
    - *Large Coastal Sharks* complex is subject to overfishing. This complex is assessed as 22 species, 16 of which were listed as subject to overfishing in 2003.

Overview of overfished status in 2004

- 200 stocks or stock complexes are known with respect to their overfished status. Of these:
    - 144 stocks or stock complexes are not overfished.

  - 56 stocks or stock complexes are overfished.
- 487 stocks or stock complexes have overfishing thresholds not defined or applicable, or are unknown with respect to their overfished status.

Changes in overfished status in 2004

Changes in overfished status determinations are listed below. Specific changes from 2003 to 2004 by region are found in Table 11, at the end of this report.

- In the Northeast Region –
  - *Butterfish* is overfished.
  - *Black sea bass* is no longer overfished and is rebuilding.
- In the Southeast Region –
  - *Tilefish*, listed as *golden tilefish* in previous reports, is no longer listed as overfished.
  - *King mackerel - Gulf group* is no longer overfished and is rebuilding.
  - *Dolphin* is not overfished, having been listed previously as unknown.
  - *Cobia* is not overfished, having been listed previously as unknown.
- In the Southwest Region
  - *Skipjack tuna – Eastern Pacific* is not overfished. This stock was listed previously as unknown in the Pacific Islands Region.
- In the Northwest Region –
  - *Lingcod* is no longer overfished and is rebuilding.
  - *Pacific ocean perch* is no longer overfished and is rebuilding.
  - *Pacific whiting*, which was estimated to be above the target rebuilding biomass in 2003, is no longer considered overfished and is rebuilt.
  - *Cabezon* is not overfished, having been listed previously as unknown.
- In the Pacific Islands Region –
  - The *Seamount Groundfish complex – Hancock seamounts* is overfished. Previous determinations had indicated that *pelagic armorhead* is overfished. In this year's report, that stock is assessed as the indicator species of this 3-species complex that includes *raftfish* and *alfonsin*.
- In the Alaska Region –
  - *Blue king crab - Saint Matthew Island* is overfished.
  - *Tanner crab - Eastern Bering Sea* is overfished.
  - *BSAI Northern rockfish* is not overfished, having been listed previously as unknown.
  - *GOA Deep Water Flatfish* complex is not overfished. This complex contains 3 species, all of which were listed previously as unknown.

    - *GOA flathead sole* is not overfished, having been listed previously as unknown.
- For the Atlantic HMS division –
    - *Large Coastal Sharks* complex is overfished. This complex is assessed as 22 species, 15 of which were listed as overfished in 2003.

Approaching an overfished condition

The basis for determining whether a stock is approaching an overfished condition is an examination of the current stock biomass and trends in fishing effort. Unless the status of the stock is known, a determination about whether the stock will become overfished within 2 years cannot be made with any certainty. Therefore, the definition for the biomass threshold in the FMP, along with trends in fishing effort, should be the determining criteria in evaluating whether a stock is approaching an overfished condition. In some cases, the pre-SFA definition has remained in the FMP and was used as the basis for the determinations. Also, for Pacific salmon stocks, the determining criteria are based on maximum sustainable yield/maximum spawner potential objectives for natural stocks or stock complexes.

- One stock is listed as approaching an overfished condition: HMS *yellowfin tuna - Atlantic*.

Table 2. Description of Major and Minor Stocks by Council, 2004.

Jurisdiction*	Stock Group	Number of Stocks	Overfishing					Overfished					Approaching Overfished Condition
			Yes	No	Not Known	Not Defined	N/A	Yes	No	Not Known	Not Defined	N/A	
NEFMC	Major	27	9	12	5	1	0	10	15	2	0	0	0
	Minor	9	0	2	6	1	0	5	4	0	0	0	0
	Total	36	9	14	11	2	0	15	19	2	0	0	0
MAFMC	Major	11	3	8	0	0	0	3	7	1	0	0	0
	Minor	0	0	0	0	0	0	0	0	0	0	0	0
	Total	11	3	8	0	0	0	3	7	1	0	0	0
NEFMC/ MAFMC	Major	3	2	1	0	0	0	0	2	0	1	0	0
	Minor	0	0	0	0	0	0	0	0	0	0	0	0
	Total	3	2	1	0	0	0	0	2	0	1	0	0
SAFMC	Major	24	8	9	7	0	0	5	11	8	0	0	0
	Minor	64	3	13	46	2	0	6	5	46	7	0	0
	Total	88	11	22	53	2	0	11	16	54	7	0	0
GMFMC	Major	22	4	7	9	2	0	4	6	9	3	0	0
	Minor	33	0	7	26	0	0	2	0	26	5	0	0
	Total	55	4	14	35	2	0	6	6	35	8	0	0
SAFMC/ GMFMC	Major	9	0	9	0	0	0	0	9	0	0	0	0
	Minor	2	0	0	1	1	0	0	0	1	1	0	0
	Total	11	0	9	1	1	0	0	9	1	1	0	0
CFMC	Major	4	1	1	2	0	0	1	1	2	0	0	0
	Minor	175	0	8	152	15	0	2	0	136	37	0	0
	Total	179	1	9	154	15	0	3	1	138	37	0	0
PFMC	Major	65	3	36	14	1	11	4	34	13	3	11	0
	Minor	102	0	4	56	0	42	2	1	57	0	42	0
	Total	167	3	40	70	1	53	6	35	70	3	53	0
WPFMC	Major	13	1	4	8	0	0	0	5	8	0	0	0
	Minor	22	0	3	17	2	0	1	1	18	2	0	0
	Total	35	1	7	25	2	0	1	6	26	2	0	0
PFMC/ WPFMC	Major	5	1	1	3	0	0	0	2	3	0	0	0
	Minor	5	0	1	4	0	0	0	1	4	0	0	0
	Total	10	1	2	7	0	0	0	3	7	0	0	0
NPFMC	Major	53	0	49	3	1	0	1	31	0	21	0	0
	Minor	17	0	9	8	0	0	3	1	0	13	0	0
	Total	70	0	58	11	1	0	4	32	0	34	0	0
PFMC/ NPFMC	Major	1	0	1	0	0	0	0	0	0	1	0	0
	Minor	0	0	0	0	0	0	0	0	0	0	0	0
	Total	1	0	1	0	0	0	0	0	0	1	0	0
HMS	Major	15	6	7	2	0	0	4	8	2	0	0	1
	Minor	7	3	0	4	0	0	3	0	4	0	0	0
	Total	22	9	7	6	0	0	7	8	6	0	0	1
TOTAL	Major	252	38	145	53	5	11	32	131	48	29	11	1
	Minor	436	6	47	320	21	42	24	13	292	65	42	0
	Total	688	44	192	373	26	53	56	144	340	94	53	1

* NEFMC = New England Fishery Management Council; MAFMC = Mid-Atlantic Fishery Management Council; SAFMC = South Atlantic Fishery Management Council; GMFMC = Gulf of Mexico Fishery Management Council; CFMC = Caribbean Fishery Management Council; PFMC = Pacific Fishery Management Council; WPFMC = Western Pacific Fishery Management Council; NPFMC = North Pacific Fishery Management Council; HMS = Atlantic Highly Migratory Species.

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September 12, 2005

Dear Don:

I would like to follow up with you about the enclosed paper, *Strengthening Scientific Input and Ecosystem-Based Fishery Management for the Pacific and North Pacific Fishery Management Councils,* that was just released at today's American Fisheries Society meeting in Anchorage.

We produced the paper based on the discussions of a panel of experts that we assembled. Many of the panelists will be familiar to you. The panel was chaired by Dr. Richard Marasco; other members included Dr. Daniel Goodman, Dr. Churchill Grimes, Dr. Peter Lawson, Dr. André Punt and Dr. Terry Quinn. We selected these participants because they were highly regarded scientists and were familiar with the workings of both the North Pacific and Pacific Fishery Management Councils and had all served on the scientific review committees of various fishery management councils.

We convened the panel to examine two recommendations from the reports of the U.S. Commission on Ocean Policy and the Pew Oceans Commission regarding having fisheries management become more ecosystem-based and strengthening the role of science in fishery management. We wanted to examine how well our part of the coast was doing regarding these two topics and how we could progress. We were offered funding to do this by the Marine Conservation Alliance of Juneau, Alaska, though the Alliance did not have any role in picking the panel or preparing or editing the paper.

We intended the paper to provide practical recommendations for moving forward on these two topics and I would like to request that, as time and your committee process permits, your Council could review the recommendations of this paper (and provide us any additional feedback to improve this paper to distribution to other Councils). Thanks in advance for any consideration.

Sincerely,

Randy Fisher
Executive Director

cc Don Hansen

205 SE Spokane St., Ste 100, Portland, Oregon 97202
503-595-3100

Contact: Randy Fisher, executive director: 503-595-3100
Fran Recht, habitat program manager: 541-765-2229

COMMISSION PANEL RELEASES REPORT ON ECOSYSTEM MANAGEMENT; STRENGTHENING SCIENCE IN FISH MANAGEMENT

A panel of scientists convened by the Pacific States Marine Fisheries Commission (PSMFC) issued a report today on ways to move toward an ecosystem based management system and strengthen the role of science in fishery management. Both are recommendations recently made by the U.S. Commission on Ocean Policy.

"The Panel was able to provide practical suggestions regarding the elements and steps that can be taken to transition from a predominantly single-species approach, to a fully specified and integrated ecosystem based approach. This will not involve starting anew but will move incrementally forward," said panel member Dr. Terry Quinn.

Dr. Quinn will present the results of the paper, *Strengthening Scientific Input and Ecosystem-Based Fishery Management for the Pacific and North Pacific Fishery Management Councils,* today at a symposium on ecosystem management that is part of the 135th annual meeting of the prestigious American Fisheries Society in Anchorage, Alaska.

Recognizing that the process of incorporating ecosystem considerations into fishery management decisions is an evolutionary one, the panel crafted a definition of ecosystem-based fishery management (EBFM), and identified a process that would help Fishery Management Councils move from the existing approach that considers ecosystem interactions in an often peripheral way, to a system that explicitly incorporates EBFM considerations into fishery assessments.

The EBFM approach recognizes the broader uses of the marine environment including commercial fishing and the need to accommodate sometimes competing societal goals and objectives. According to the report, further progress could be made with an approach that:

- Recognizes, upfront, an expanded list of societal goals in EBFM;
- Develops and tests new management models that incorporate these goals;
- Includes such factors as oceanography, habitat productivity, food-web interactions, life-history, environmental trends, and uncertainty considerations, and,

- Evaluates these measures to assure that specific goals are being met.

The need to obtain additional resources and research funding to bridge the gap between current fishery management practices and EBFM is critically important.

The panel noted that both the Pacific and North Pacific Fishery Management Councils already incorporate steps that are consistent with an EBFM approach such as setting conservative catch limits, protecting habitat, establishing marine protected areas, protecting forage fish, and reducing bycatch.

The panel thought existing mechanisms for scientific input into fishery management decisions worked well in the North Pacific and Pacific Fishery Management Councils. In moving towards EBFM, the role of the Councils' Scientific and Statistical Committees will expand and may require the addition of scientists with expertise in specialties not yet represented on the committees.

Important roles for the science committees include reviews of the stock assessments and harvest formulas and the setting of the acceptable biological catch. The panel noted that while such computations are a scientific process, some key elements of the calculation are set by policy.

The panel concluded that Councils should not be separated or insulated from their Scientific and Statistical Committees. There will always be policy choices and tradeoffs within the scope of the discretionary authority of the council, but members will be in a better position to use that latitude if their scientists can inform them of the probable consequences of their choices. A close working relationship between the council and its scientists will facilitate such communication.

The panel met July 19 and 20 in Seattle, Washington and was chaired by Dr. Richard Marasco of the Alaska Fisheries Science Center. Other member included Dr. Daniel Goodman of Montana State University; Dr. Churchill Grimes of the Southwest Fishery Science Center in Santa Cruz; Dr. Peter Lawson of the Northwest Fisheries Science Center; Dr. André Punt with the University of Washington; and Dr. Terry Quinn of the University of Alaska.

Formed by Congress in 1947, the Pacific States Marine Fisheries Commission promotes policies and actions to conserve, develop, and sustainably manage our valuable Pacific fishery resources.

Copies of the full report, *Strengthening Scientific Input and Ecosystem-Based Fishery Management for the Pacific and North Pacific Fishery Management Councils* are available on the PSMFC website (www.psmfc.org), by contacting Fran_Recht@psmfc.org, or by calling 503-595-3100 or 541-765-2229.

Strengthening Scientific Input and Ecosystem-Based Fishery Management
for the Pacific and North Pacific Fishery Management Councils

Suggestions from a panel discussion
July 19-20, 2005
Seattle, Washington

Panel
Richard Marasco (chair)
Daniel Goodman
Churchill Grimes
Peter Lawson
André Punt
Terry Quinn

with assistance from
Dave Hanson
Fran Recht
Jodie Little

Pacific States Marine Fisheries Commission

July 2005

Abstract

A panel of scientists was convened by the Pacific States Marine Fisheries Commission for an intensive two day meeting to examine practical ways that the Pacific and North Pacific Fishery Management Councils (FMCs) could address two of the recommendations recently made by the U.S. Commission on Ocean Policy. One theme addressed ways to move towards an ecosystem-based approach to fisheries management. The other theme addressed the role of science in fishery management Council decisions, how to strengthen that role, and whether to separate conservation issues (how many fish are appropriate to catch) from allocation issues (who gets to catch them).

Recognizing that the process of incorporating ecosystem considerations into fishery management council decisions is an evolutionary one, the panel crafted a definition of ecosystem-based fishery management (EBFM), identified characteristics that were specific to an EBFM approach, and identified a process that would help the FMCs move forward in incremental ways, from the existing management approaches that generally consider ecosystem interactions in an implicit and often peripheral way, to a management system that, over time, would incorporate explicit EBFM considerations into the fishery assessments themselves.

The EBFM approach recognizes the broader uses and users of the marine environment (including fishing). There is a need to consult with, accommodate and, to the extent possible, reconcile the many societal goals and objectives of these users, so that future generations can also benefit from the full range of goods and services provided by the ecosystem. The development and testing of models that incorporate ecosystem considerations explicitly will focus attention on the research and monitoring needed to improve the models and reduce uncertainty. There also will be a need for a more rigorous setting of operational objectives and decision rules, and for the evaluation of management performance.

The panel noted that both FMCs, and particularly the North Pacific FMC, are already working to manage fisheries conservatively, to protect habitat, establish marine protected areas, protect forage fish, and to reduce bycatch--all tactics that are consistent with an EBFM approach. Additionally, the North Pacific FMC has established indicators of ecosystem health (and a monitoring plan for them). Further progress could be made with an approach that (1) recognizes, upfront, an expanded list of societal goals, (2) develops, tests, and uses new models for management that explicitly incorporate these goals (3) include factors such as oceanography, habitat productivity, food-web interactions, life- history, spatial variability, environmental trends, and uncertainty considerations, and (4) evaluates these measures to assure that specific goals are being met. Progress is critically dependent upon obtaining additional resources and funding to bridge the gap between current fishery management practices and EBFM.

The panel thought the existing mechanisms for scientific input into fishery management decisions worked well in the North Pacific and Pacific FMCs. In moving forward towards EBFM, the role of the FMC's Scientific and Statistical Committees (SSCs) will continue, however their workload will be greater and may require the addition of scientists with expertise in specialties that are not yet represented on the committees. The panel emphasized that important roles for SSCs include the specification of the acceptable biological catch (ABC), including reviews of the stock assessments and harvest formulas that are used to calculate ABC, and analysis describing relevant effects (including the extent of risk and uncertainty) of harvest alternatives and other management measures (Witherell, 2005).

The Panel noted that, while computation of an ABC is a scientific process, some of the key constraints in the calculation may be set by policy. In the future, as decision rules become more sophisticated, the quantification of uncertainty will become more formalized. That is, the stipulation of risk-related policy, namely the specification of how risk-averse or risk-tolerant the decision process should be, will become increasingly important. The formulation of such policy is not the role of scientific advisory bodies such as SSCs, but it should not be left to ad hoc decisions of the moment either. The goal of such formalized policy is to achieve consistency and stability across time and across districts, serving the best interest of society as a whole, in the long run, and putting more distance between the decision process and narrower considerations of expediency. For this reason, such policy should be the subject to national debate and independent scientific peer review. Regional differences must be recognized. Within such a framework, with its heavy technical demands, the role of scientific advisory bodies, such as SSCs, is to provide scientific quality control and quality assurance.

The panel concluded that SSCs should not be separated and insulated from the FMCs. Fisheries are not managed by science alone, but good fishery management cannot afford to ignore good science, and needs ready access to it. There will always be policy choices and tradeoffs that may be within the scope of the discretionary authority of the FMC, but the FMC will be in a position to better use that latitude if the SSC informs the FMC of the probable consequences of their choices. A close working relationship of a FMC with its SSC, which can be fostered by having both bodies meet at the same time, will facilitate such communication.

The Panel also suggested that the role of science and, thus, the SSCs would be strengthened if NOAA Fisheries and the Secretary of Commerce would ask for a rigorous justification from the FMC if decisions were contrary to scientific advice. It should be made clear that SSC members are to act independently as scientists (and at times may disagree with their agency positions). Additionally, there may be value in having periodic national or regional meetings of the SSCs to develop common operating procedures and to compare approaches to providing scientific advice.

Background

Echoing concerns of other reports and studies regarding the sustainability of marine ecosystems and the depletion of many fish species, the U.S. Commission on Ocean Policy (USCOP) recently recommended that the United States move towards an ecosystem based approach to management, including fisheries management. While this idea is good, there are substantial outstanding issues with defining what an ecosystem-based approach to management is and how it might be implemented.

Additionally, the USCOP recommended severing the Scientific and Statistical Committees (SSCs) from the Fishery Management Councils (FMCs), and separating "conservation issues" from "allocation issues", because of concerns that political and fishing industry pressure may have resulted in some FMCs setting catches higher than was prudent[1]. While some see this

[1] The U.S. COP notes that: "Although fishery data collection and stock assessment models can always be improved, a lack of adequate scientific information has not been the main culprit in most instances of overfishing. The Mid-Atlantic and New England FMCs [Regional Fishery Management Councils], which managed fourteen of the thirty-three stocks that experienced overfishing in 2001, have some of the best scientific support in the world. A 2002 National Research Council report concluded that the problem in most cases of overfishing was that the RFMCs

recommended separation as a way to promote the role of science in the fishery management decision making process, others see the potential for establishing conflicting bureaucracies and allowing political bodies more freedom to be subject to constituent influence.

There have been other reviews, workshops, and conferences that have addressed these topics and made recommendations (for example NMFS 1999, NRC 1999, Pew Oceans Commission, 2003, Busch 2003, FAO 2003, Witherell 2004, U.S. Commission on Ocean Policy 2004), most recently the Managing our Nation's Fisheries II conference in Washington, D.C. in March of this year (Witherell, 2005). However, there was interest in looking more specifically at these topics, considering the work that the North Pacific and Pacific FMCs[2] have already undertaken, in order to explore opportunities and mechanisms for additional progress towards Ecosystem-based Fishery Management (EBFM) and strengthening scientific input.

The Pacific States Marine Fisheries Commission (PSMFC) convened a panel of scientists to draft recommendations on these two topics, with a view toward specific applicability and utility to the FMCs. Panelists were chosen by PSMFC based on their technical qualifications, their familiarity with the operation of the North Pacific and Pacific FMCs, and their knowledge of the workings of their scientific and statistical committees. The list of panelists and short biographies are presented in Appendix 1. The panel was provided a briefing book of background materials and some additional documents at the meeting (see references). The panel discussion was held July 19th and 20th in Seattle, Washington at the SeaTac Marriott hotel. The discussion was chaired by Dr. Rich Marasco, and was organized around the specific questions stated by PSMFC in the charge to the panel (the questions are listed in Appendix 2).

The Marine Conservation Alliance (MCA) of Juneau, Alaska provided funding for this project. MCA has not been involved with developing or reviewing report contents. It is strictly a project of the PSMFC.

Discussion

Ecosystem-based Fishery Management

The first topic addressed by the Panel related to EBFM. Three questions were posed by the PSMFC. The first one was:

1. What is a practical definition of an ecosystem-based approach to fisheries management that could be used by fishery management councils?

Many definitions of an ecosystem-based approach to management and fisheries management have been suggested. Some are noted in Table 1. There are recurring themes in all of these definitions. For example, there is recognition that ecosystem-based approaches recognize broader uses and users of the marine environment (including fishing) and the need to accommodate and reconcile the many objectives of these users so that future generations can also benefit from the full range of goods and

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disregarded or downplayed valid scientific information when setting harvest guidelines. Neither NMFS nor the Secretary of Commerce used their authority to prevent the RMFCs from taking such actions.

[2] These FMCs manage fish off Alaska and Washington, Oregon, and California, respectively.

services provided by the ecosystem. The approach also recognizes that humans are an essential component of the ecosystem in which fishing takes place, and it focuses on the interactions within the system. This is in contrast to current fishery management practices which focus on individual species, and do not deal with ecosystem issues in a comprehensive way.

Therefore the purpose of an EBFM approach is to plan, develop and manage fisheries in a manner that addresses the multiple needs and desires of societies without jeopardizing the options for future generations to benefit from the full range of goods and services provided by marine ecosystem.

Finding

The panel noted that there was no lack of good definitions. However, there was a desire to craft one that would help indicate to the FMCs what is needed above and beyond what is already being done. Simplicity was considered an important characteristic of a good definition. There also was interest in constructing a definition that would recognize interactions among various parts of the system, as well as the need to consider a broader set of societal goals and values. In addition, there should be recognition of the importance of defining goals and recognizing that there would be trade-offs between potentially competing societal goals. Finally, the definition should be value-free, steer clear of narrowly specifying matters where the substance of the science is evolving, and be applicable to the whole spectrum of management approaches from the current single species focus to a more explicit approach to ecosystem-based management. The following definition was considered to satisfy these concerns:

"Ecosystem-based fishery management recognizes the physical, biological, economic and social interactions among the affected components of the ecosystem and attempts to manage fisheries to achieve a stipulated spectrum of societal goals, some of which may be in competition."

Table 1—Definitions Used By Others

Ecosystem-based Approach to Management (or Fisheries Management)

The North Pacific Fishery Management Council :
"Ecosystem-based approach to fisheries management is defined as the regulation of human activity towards maintaining long-term system sustainability (within the range of natural variability as we understand it) of the North Pacific covering the Gulf of Alaska, the Eastern and Western Bering Sea and the Aleutian Islands region."

The Food and Agricultural Organization of the United Nations (FAO 2003):
"An ecosystem approach to fisheries strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries."

The Scientific Consensus Statement on Marine Ecosystem-Based Management (McLeod et. al. 2005):
"Ecosystem-based Management is an integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity or concern; it considers cumulative impacts of different sectors. Specifically, ecosystem-based management:

- *emphasizes the protection of ecosystem structure, functioning and key processes;*
- *is placed-based in focusing on a specific ecosystem and the range of activities affecting it;*
- *explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species;*
- *acknowledge interconnectedness among systems, such as between air, land and sea; and*
- *integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependences."*

The National Research Council (NRC 1999):
"Ecosystem-based management is an approach that takes major ecosystem components and services—both structural and functional—into account in managing fisheries. It values habitat, embraces a multispecies perspective, and is committed to understanding ecosystem processes. Its goal is to achieve sustainability by appropriate fishery management." (NRC 1999)

The second question addressed by the panel was:

2. What are the characteristics or management elements of an ecosystem based approach to fisheries management? Are the elements identified by the National Research Council (NRC 1999) and the Ecosystem Principles Advisory Council (NMFS 1999) still appropriate? Are there other elements or characteristics that should be included?

In considering this question, the panel reviewed a number of background documents regarding the characteristics of an EBFM approach. Table 2 is a sampling of some suggestions made by various panels and committees.

The Panel stressed that it is important to recognize that EBFM is neither inconsistent with, nor a replacement for, current fisheries management approaches. This means that EBFM is likely to be adopted as an incremental extension of current fisheries management approaches. The challenge will be to find ways to move forward given the high degree of uncertainty involved in employing new approaches, and not allowing this uncertainty to be a license to maintain the *status quo*. Rather, the uncertainty should be taken as a mandate to improve current understanding.

The single species assessment and management approach has a long empirical record. The approach has well defined models (Quinn and Deriso 1999), with research being conducted to fill data gaps to improve models (Quinn 2003, Quinn and Collie 2005). Properly used, it has been effective. Failures almost exclusively have not been due to the science and management approach, but rather due to political will and data limitations (Fogarty and Murawski 1998, Sissenwine and Mace 2001). The single species approach does incorporate ecosystem considerations. However, the ecosystem in these models is generally treated as a single collapsed background factor. The following are examples where ecosystem features have been included: a) a stock recruitment curve with density dependence for a given species may originate from predation by another species, b) time-varying natural mortality in a model may also be due to predation or disease effects, and c) the set of years used to define reference points may take account of perceived regime shifts (Quinn and Collie 2005).

It has been suggested that perhaps the most significant changes required for an EBFM would be an adjustment in thinking about goals to reflect a broader set of societal values than those involving the targeted fish species, and different (additional) scientific inputs that would be needed to help inform models to achieve those goals and the management strategies employed.

The panel agrees with the perspective expressed in a study conducted for the North Pacific FMC (Goodman et. al 2002) that:

> "…moving from the conventional assessment view towards an ecosystem view involves a shift in the components of fundamental underlying ecological science that is relied upon. In essence, for current fishery management, population ecology is the fundamental ecological science, but for an approach that takes ecological and ecosystem considerations into account, community ecology is the fundamental ecological science. For example, when one thinks about single species, there can be "excess production" from a stock, but when one thinks about the "needs" of all the other species in an ecosystem, the notion of excess production from a single member of the community becomes far more complicated."

Table 2—Suggestions from Others
Characteristics of an Ecosystem-based Fishery Management Approach

Ecosystem Principles Advisory Panel (EPAP) (NMFS 1999):
"A comprehensive ecosystem-based fisheries management approach would require mangers to:

- consider all interactions that a target fish stock has with predators, competitors, and prey species;
- the effects of weather and climate on fisheries biology and ecology;
- the complex interactions between fisheries and their habitat;
- And the effects of fishing on fish stocks and their habitat."

Scientific Consensus Statement on Marine Ecosystem-based Management (McLeod 2005) (from those suggested by the U.S. COP and Pew Commission reports):

- Make protecting and restoring marine ecosystems and all their services the primary focus, even above short-term economic or social goals for single services.
- Consider cumulative effects of different activities on the diversity and interactions of species.
- Facilitate connectivity among and within marine ecosystems by accounting for the import and export of larvae, nutrients and food.
- Incorporate measures that acknowledge the inherent uncertainties in ecosystem-based management and account for dynamic changes in ecosystems. In general, levels of precaution should be proportional to the amount of information available; the less that is known about a system, the more precautionary management decisions should be.
- Create complementary and coordinated policies at global, international, national, regional, and local scales, including between coasts and watersheds. (Appropriate scales for management will be goal-specific.)
- Maintain historical levels of native biodiversity in ecosystems to provide resilience to both natural and human-induced changes.
- Require evidence that an action will not cause undue harm to ecosystem functioning before allowing that action to proceed.
- Develop multiple indicators to measure the status of ecosystem functioning, service provision and effectiveness of management efforts.
- Involve all stakeholders through participatory governance that accounts for both local interests and those of the wider pubic.

The Marine Fisheries Advisory Committee's (MAFAC) Ecosystem Approach Task Force (Busch 2003) suggested these elements:

- Enhancing intra-and inter agency cooperation and communication
- Delineating geographic area(s) of the ecosystem
- Preparation of quantified natural resource goals and objectives
- Identify and apply specific indicators
- Socio-Economic data to evaluate management tradeoffs

In moving to EBFM, the challenge will be isolating the influence of individual ecological factors (e.g. climate and oceanographic conditions) and developing an understanding of important interactions. High levels of uncertainty will be associated with efforts focused on characterizing these relationships. The uncertainty results from the limitations of currently available data for estimating parameters for ecosystem models and for validating these models. A critical danger is that without any track record for such models, the assumptions could be completely wrong. There is little such danger with the current single-species approaches. For this reason, it is likely that when scientists and managers select management procedures based on a likelihood of achieving the management objectives, there will be a tendency to avoid this uncertainty and choose procedures similar to the present procedures which are based primarily on conservative single-species management. However, selection of new management system features that are robust to uncertainty is possible when there is consistency across a number of different models. In other words, there are technical means for filtering out the most risky aspects of new, unproven models, while still giving a fair trial for innovation.

Additionally, though the management systems may look similar during the transition to EBFM, the increased importance and use of ecosystem models will assist in the identification of approaches to consider when designing management procedures, defining decision rules, and planning investments in research and monitoring. The design and employment of new models will also assure that there is at least qualitative consideration of interactions before management decisions are made.

Until necessary research is done, it is not possible currently to know what the optimal model configuration and corresponding data requirements will be for an ecosystem-based management approach. It could be that a set of single-species models combined with collection of ecosystem indicators and prudent management strategies could suffice for many systems. For others, it may be necessary to develop complex ecosystem models with links among fish species, oceanography, climate, habitat, and human elements. It is also possible that the lofty goals of understanding the ecosystem and managing human uses sustainably are not achievable with finite resources and modeling capabilities. In that case, the goal may have to be limited to an achievable one, in which the risks of ecosystem harm are minimized through robust procedures that account for errors due to incomplete understanding.

Regardless, it is to be expected that substantial attainment of the goals of EBFM will require more and better data than are routinely available at present, and will involve more complicated scientific models than are routinely used for current management advice. To get this work done, funding and resources will be needed.

The panel considered various management methodologies (e.g. conservative single-species management, bycatch reduction, marine reserve establishment) as suggested by the NRC and EPAP (see Appendix 3). The panel noted that the items in these lists could be considered to be primarily tactical (how goals are achieved) rather than strategic elements of an EBFM approach (which set out the goals). Many of the suggestions include items that go well beyond those specific to EBFM approaches. The Panel noted that there was an absence of quantitative specificity associated with the lists. That is, though these tactical approaches may fit into an EBFM approach (i.e. a reduction of fishing capacity is desired), they don't answer the question of effectiveness at meeting EBFM objectives.

Finding Question 2
The panel came up with a list of eight "key elements" that are believed to be particular to an EBFM approach. In the construction of this list, emphasis was placed on identifying elements that are either new or in need of elevated attention. It is recognized that it will take time and a significant commitment to fully address these eight elements. Additional resources and funding will be required. How this information can be used and integrated is addressed in the findings for Question 3, below.

Elements of an ecosystem-based fishery management approach

1. Employs spatial representation
2. Recognizes the significance of climate/ocean conditions
3. Emphasizes food web interactions
4. Ensures broader societal goals are taken into account (possibly by incorporating broader stakeholder representation)
5. Utilizes an expanded scope of monitoring (total removals, cumulative effects, non-target species, environmental covariates)
6. Acknowledges and responds to higher levels of uncertainty
7. Pursues ecosystem modeling/research
8. Seeks improved habitat information (target and non-target species)

The rationale for these elements is as follows:

Spatial representation: Accounting more explicitly for space ("spatial thinking") is a practical way of moving forward with EBFM. Currently, management focuses on temporal and age-structured considerations. Spatial thinking can help define how and where human activity (both fishing and non-fishing) affects the ecosystem (fishing as well as non-fishing impacts), and delineate the management needed to deal with different user groups (e.g. zoning and marine protected areas). It is at the heart of understanding spatially explicit population dynamics (e.g. fish movements over time and space) and stock structure. Without finer scale spatial subdivisions, species would all be managed as one homogeneous population, which functionally negates the rationale for good management measures such as spreading out catch over different areas and times to protect life-history characteristics and biodiversity, as has been done with the Bering Sea and Gulf of Alaska pollock fisheries (in consideration of localized availability of prey to Steller sea lion, for example).[3]

[3] To date, a wide variety of spatial models and approaches for fish and terrestrial populations have been used (Quinn and Deriso 1999). There has been limited application of these models due to the absence of necessary data on fish movement and population variables by spatial designation. Even when movement data are available (such as with Pacific halibut and Gulf of Alaska sablefish), spatial models are rarely used for stock assessment, because of the greater complexity and the lack of a substantial difference compared with the non-spatial assessment. However, in many cases, reasonable spatial distributions of harvest recommendations can be made from the whole area (non-spatial) assessment by partitioning with spatial survey biomass and catch information, as is done for many NPFMC stocks (e.g., GOA pollock, cod, sablefish).

Climate/ocean conditions: There is ample evidence of the importance of climate regime shifts and inter-annual variations in oceanographic conditions to the reproduction and survival of fish and other species. For example, it is known on the west coast that salmon, sardines, marine mammals, Alaska crab, pollock and other west coast groundfish are sensitive to regime changes (Beamish, ed. 1995, McGinn, ed. 2002). Some regimes favor some species over others, and this depends on life history characteristics, their position in the food chain, and other factors. Since the North Pacific and Pacific FMC's maximum sustainable yield calculations for groundfish are based on productivity, it would be prudent for management to change when the climate regime changes, and to anticipate changes if that proves possible. Much of the information on how climate/ocean patterns might impact species has been generated from retrospective analyses of oceanographic conditions. While predictive ability is still low, consideration of different strategies for management relative to climatic factors and species life histories is important in an EBFM approach. Further, research will help make these strategies more robust.

The North Pacific (the Gulf of Alaska and the Bering Sea), has experienced good environmental conditions for fish productivity since about 1976 due to a regime shift. There is speculation about other regime shifts (in 1989 and after), which could affect future productivity. It will be interesting to see how robust management strategies currently in place will perform. In contrast, the U.S. West Coast (Washington, Oregon, and California) has experienced poor environmental conditions over the same period. Alternative management strategies had to be put into place to deal with low productivity of many stocks (especially rockfish). It will be interesting to see if these strategies allow west coast stocks to fully recover.

Food Web Interactions: Food web considerations are important in EBFM because there have long been indications that harvesting low down on the food chain (lower trophic levels) has disproportionately larger impacts on species at the top of the food chain (higher trophic levels). For example, sensitive top predators such as sea birds may not be able to switch prey as quickly as their prey species are fished down, and impacts of forage fish depletion shows up as increased seabird mortality. Additionally, the present ability of the science to quantify the variable natural mortality of fish and other organisms at lower trophic levels is very limited, leading to a high degree of uncertainty and the need for precautionary management.

The National Marine Fisheries Service's Alaska Fisheries Science Center has maintained a food consumption database for fishes in the Gulf of Alaska and Bering Sea for over twenty years. As models become refined and better understanding of species interactions is obtained (through data analysis and field research programs), the implications of these changes for fisheries management may be better understood.
There is also some limited information of this type available for the west coast.

Broader goal specification and recognition: EBFM encompasses consideration of broader use and users of the ecosystem. Since fisheries goals are only a subset of societal goals, EBFM will involve consideration of a broader set of impacts. This may also require expanded participation and representation in the FMC process.

Moving from high-level policy goals to operational objectives is a major challenge in areas where the goals deal with concepts such as ecosystem integrity, ecosystem health and biodiversity. Given the broader stakeholder base under EBFM, there frequently will be a need for institutions to coordinate consultations. Joint decision making will be needed between fisheries that operate in the same geographic area and other non-fishery related user groups that interact with them.

Pertinent societal goals would include national, regional and fishery specific goals, but would also extend beyond fisheries goals to accommodate constraints imposed by legislation and regulatory "goals". These would include the Magnuson Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act)[4], the Endangered Species Act, and the Marine Mammal Protection Act. Within an EBFM approach, these broader goals will need to be reflected and accommodated more explicitly in management models and actions.

Expanded Scope of Monitoring and Research: Monitoring and research for EBFM will be qualitatively different than the current work (i.e. will involve new and different work and the use of that work in management decisions) but probably will not replace the need for continuing the current monitoring. Monitoring and research for EBFM will involve understanding interactions. It should include the amount of total removals of species associated with fishing (e.g. total removals of target species as well as non-target species including other fish, invertebrates, birds, etc.). There is also need to understand cumulative effects, including those from non-fishing activities (e.g. point and non-point pollution, habitat alteration, etc.) Additionally, monitoring is essential to determine the magnitude and timing of climatic variations and to understand how these patterns affect various target and non-target species.

Uncertainty (acknowledge and respond to higher levels of): High levels of uncertainty are associated with the current understanding of ecosystem functions, interactions and feedback loops. Additionally, present ecosystem models are rudimentary for marine systems. However, even if the interactions are poorly quantified, models can be used to help focus attention on ecosystem thinking, which is part of the attitude shift needed for an EBFM approach. It is important to note that while there will never be complete information, there needs to be a focus on what information can be collected to improve estimates of the level of uncertainty so that management can take realistic account of it.

Ecosystem modeling/research: On-going review of ecosystem models, from the perspective of quantifying uncertainty and identifying critical data needs to reduce uncertainty, should receive high priority. Ecosystem modeling will also require development of ways to quantify trade-offs among objectives. It could be helpful to identify the data types that are cheap or easy to collect (e.g. remote sensing data collected by others), as well as to set priorities for the most important information that is more expensive to collect but that would help separate out the "noise" from the "signal". For example, among other things, there is a need to collect ecosystem data that are not associated with data collected during fishing activities (i.e., "fishery-independent data"). Further, there is a need to continue research that is focused on how climate/ocean patterns impact different fish species.

Habitat: An increased and expanded focus on habitat considerations is needed for an EBFM approach. While the Magnuson-Stevens Act calls for the protection of essential fish habitat from fishing impacts, to the extent practical, current understanding of physical habitat for spawning, rearing, feeding, etc. of fishery resources is limited, and existing knowledge of ephemeral pelagic habitat, e.g. oceanographic features like fronts, eddies and other current patterns, is even

[4] The Magnuson-Stevens Act requires, among other things, the protection of Essential Fish Habitat, reduction of bycatch, the rebuilding of over-fished stocks and consideration of social and economic considerations.

more rudimentary. Similarly, it is known that habitat is an important consideration for marine mammals and presumably for many non-managed species, but habitat needs are understood only for a minority of these species. There is also a need to focus more attention on understanding the cumulative effects on habitat and how it affects both the target and non-target species.

The third question addressed by the panel was:

3. Are there practical ways for the North Pacific and Pacific Fishery Management Councils to incorporate these elements or characteristics further into their respective fishery management programs? How can these Councils improve their incorporation of ecosystem factors in their decision making in the near term? What longer-term changes are needed?

The panel saw the process of incorporating EBFM elements in FMC decisions as an evolutionary one that will build on existing fishery management programs. Practical approaches are facilitated by considering the following continuum that describes adjustments that are needed in the fishery management process to reach the goal of EBFM (Goodman, et al, 2002).

Single species focus → Implicit treatment of ecosystem effects → Explicit treatment of ecosystem effects

In the first stage, consideration is focused on the status of the target species and its predators and prey. In the second stage attention is broadened to take into account environmental effects in a more direct fashion in determining the status of the target species and incorporates measures for the direct effects of fishing activities other than those on the target species, such as bycatch, incidental mortality and some direct effects on habitat. In stage three, the environment, target stock, and its predators and prey are integrated in the assessment before the management procedure is used to determine catch limits and other management measures.

<u>An implicit ecosystem approach</u>, stage two, recognizes the existence of ecosystem interactions, but doesn't make any specific attempts to quantify the surplus production that must be reserved to satisfy ecosystem needs, nor does it attempt to modify fishing behavior to specifically mitigate adverse impacts other than those on the target species. The focus of this approach is on the determination of the status of target and non-target species and the evaluation of measures for tractable problems (EFH and technical interactions).

<u>An explicit ecosystem approach</u>, stage three, differs from the implicit approach in that less tractable problems are added, such as, food web dynamics, predator requirements and regime shifts.

For fisheries under Federal management, the various FMCs are at different points on the continuum, but there has been movement towards EBFM, stage three. In the case of the North Pacific FMC, for example, an ecosystem considerations chapter has been included in its annual SAFE report since 1995. Currently, attention is being focused on methods that can be used to more fully integrate information contained in this chapter into the decision making process. For example, ways to inform the North Pacific FMC of climatic and oceanographic conditions and their importance in the decision making process are being developed. Information for use in the stock assessment processes is being provided to assessment scientists. Results of ecosystem model activities also are being refined to provide the FMC with information on important interactions. The FMC has also been active in implementing habitat protection and bycatch measures.

The Pacific FMC has instituted weak-stock management for groundfish (that is, managing for the "weakest link"), because it is not feasible to selectively harvest particular species. Further it has begun to consider prey interactions by protecting krill as a forage species. It has additionally protected extensive areas of habitat from trawling impacts via the EFH process. The Pacific FMC also has supported requests from the Monterey Bay National Marine Sanctuary, Cordell Bank National Marine Sanctuary and Channel Islands National Marine Sanctuary to prohibit or restrict fishing within parts of the sanctuaries for ecosystem protection.

The Pacific FMC could improve their progress towards EBFM by estimating total removals (this will involve additional observers) and adding ecosystem considerations and information into Stock Assessment and Fishery Evaluation (SAFE reports). It will also mean defining ecological goals, coming up with alternative tactical options to be considered to achieve these goals, and evaluating these alternatives. It would also involve a process to bring outside stakeholders into the process. As noted above, additional progress towards EBFM will be made at the North Pacific FMC as climate and oceanographic information and other information contained in the ecosystem considerations chapter of the SAFE report becomes integrated into the decision making process.

Clearly the task of progressing from the left side of the continuum to the right side becomes progressively harder and more costly. Management that takes ecological and ecosystem effects into account will require expanded monitoring, improvement in the understanding of behavioral relationships among fishers, the fish they catch and the prey of the harvested species. In return for this increased management complexity and expense, the FMCs can expect to see greater stability and predictability in fisheries, and possibly even greater productivity of managed stocks.

In considering actions that could be taken, the panel considered the eight recommendations that the Ecosystems Principles Advisory Panel provided in its report (EPAP, NMFS 1999). The Panel concluded that these action items could be considered a practical check list of ways for the FMCs to incorporate ecosystem considerations into their management programs:

1. Delineate the geographic extent of the ecosystem(s) that occur(s) within FMC authority, including characterization of the biological, chemical, and physical dynamics of those ecosystems, and "zone" the area for alternative uses.
2. Develop a conceptual model of the food web.
3. Describe the habitat needs of different life history stages for all plants and animals that represent the "significant food web" and how they are considered in conservation and management measures.
4. Calculate total removals—including incidental mortality –and show how they relate to standing biomass, production, optimum yields, natural mortality and trophic structure.
5. Assess how uncertainty is characterized and what kinds of buffers against uncertainty are included in conservation and management actions.
6. Develop indices of ecosystem health as targets for management.
7. Describe available long-term monitoring data and how they will be used.
8. Assess the ecological, human, and institutional elements of the ecosystem which most significantly affect fisheries and are outside FMC/Department of Commerce authority. Included should be a strategy to address those influences in order to achieve both Fishery Management Plan and Fishery Ecosystem Plan objectives.

Finding Question 3

The panel thought that the information associated with the eight items in the EPAP was practical and relevant, but didn't contain information about how the items would be used. The Panel offered the following suggestions that might be useful as additional steps that would further help the Councils incorporate EBFM considerations into their management process. Though the level of detail and data available will change over time, the considerations identified would apply in both the short term and long term. The numbers shown below refer to the original numbering of the EPAP report. Additional steps are indicated by bullets. The Panel again emphasized that the process of incorporating EBFM elements in FMC decisions will be an evolutionary one and build on existing fishery management programs.

Actions for achieving an ecosystem-based fishery management approach

1. & 8. Delineate and characterize *the* ecosystem *including* the ecological, human, and institutional elements of the ecosystem which most significantly affect fisheries.

- *Define the management goals to reflect the societal objectives*

2. Develop a conceptual model of the food web

- *Develop a conceptual model of the influence of oceanographic and climatic factors*

3. Describe habitat needs of different life history stages of significant food web plants and animals and how they are considered in conservation and management measures

- *Expand/modify the conceptual model of the ecosystem to include life history characteristics and spatial variation*

5. Assess how uncertainty is characterized and what kind of buffers against uncertainty are included in conservation and management actions

- *Identify alternative management procedures. A management procedure would include specifications for the data required as well as how those data are analyzed to determine management actions: e.g., how uncertainty is quantified statistically and how the extent of uncertainty is used in the decision rules (control rules).*

4. Calculate total removals, including incidental mortality and show how they relate to standing biomass, production, optimum yields, natural mortality, and trophic structure

- *Develop a numerical representation combining the food web model (which would include dynamic models of managed species), the oceanographic model, and explicit representation of management measures and quantities that have been identified as metrics of attainment of the management goals.*

6. Develop indices of ecosystem health as targets for management

- *Use models to identify indices that are relevant to the stated goals. Identify which indices* *can be used as the basis for decision making. 'Traffic light"*[5] *approaches may be useful.*

7. Describe available long-term monitoring data and how they are used *to estimate parameters for the model and to quantify the reliability of the model.*

- *Use the model to identify critical data gaps, and put plans in place to address them.*

- *Conduct evaluations of management procedures (Management Strategy Evaluations)*[6] *:*
  Use the model to evaluate the costs and benefits of management procedures in terms of their probability of achieving as many of the management goals as possible, calculated over a realistic range of uncertainty.

- *The Fishery Management Council would select from among these management procedures in light of their calculated performance.*

- *Implement the management procedure accordingly.*

- *Monitor to verify success of the management procedure and validity of the model.*

- *Revise the model and the management procedure wherever the monitoring data indicates that the initial approach was mistaken .*

It is recommended that this modified EPAP list of actions be used at least annually to determine progress being made in the implementation of EBFM. Discussing these items when setting catch levels and when considering management measures, will provide information to determine if any of the conditions contained in the following list exists (Murawski, 2000):

• Biomasses of one or more important species assemblages or components fall below minimum biologically acceptable limits, such that (1) recruitment prospects are significantly impaired, (2) rebuilding times to levels allowing catches near maximum sustainable yield[7] are extended, (3) prospects for recovery are jeopardized because of species interactions, or (4) any species is threatened with local or biological extinction;

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[5] Traffic light approaches turn ecosystem health indicators into "stop" or "go" recommendations for management. For example, if forage fish density falls below a set level, then fishing mortality would be reduced.

[6] Management Strategy Evaluation (MSE) is an approach that assesses the performance of a range of management strategies (for example how much harvest is appropriate) against a set of management objectives (for example maintaining biomass or a certain fishing rate), and allows the evaluation of the tradeoffs among different management strategies. They evaluate how sensitive these strategies are to uncertainty (for example, uncertainty about climate regime, how stocks are distributed spatially, and sampling effectiveness) and are also used to evaluate an implemented strategy against the predictions of the MSE.

[7] There are various definitions of maximum sustainable yield (MSY). The Pacific FMC uses the following: MSY is an estimate of the largest average annual catch or yield that can be continuously taken over a long period from a stock under prevailing ecological and environmental conditions. Since MSY is a long-term average, it need not be specified annually, but may be reassessed periodically based on the best scientific information available.

• Diversity of communities or populations declines significantly as a result of sequential "fishing-down" of stocks, selective harvesting of ecosystem components, or other factors associated with harvest rates or species selection;

• The pattern of species selection and harvest rates leads to greater year-to-year variation in populations or catches than would result from lower cumulative harvest rates;

• Changes in species composition or population demographics as a result of fishing significantly decrease the resilience or resistance of the ecosystem to perturbations arising from non-biological factors;

• The pattern of harvest rates among interacting species results in lower cumulative net economic or social benefits than would result from a less intense overall fishing pattern;

• Harvests of prey species or direct mortalities resulting from fishing operations impair the long-term viability of ecologically important, non-resource species (e.g. marine mammals, turtles and seabirds).

Goodman et al. (2002) suggest that the conditions listed above could be regarded as metrics for ecosystem status. These could provide the basis for thresholds that should be avoided in an attempt to prevent ecosystems from becoming "unhealthy".

It should be noted that the Councils and NOAA have the existing statutory and regulatory authority to move forward in these directions. In fact, as mentioned above, both the North Pacific and Pacific Fishery Management Councils have initiated actions identified in the modified EPAP list, although attention has been uneven among the items. Using these action items as a check list will serve to focus attention on important issues and facilitate the identification of critical management issues.

The panel noted that, as a practical matter, the Councils already have "full agendas," and adding new items, especially those with high levels of uncertainty, will be difficult. One fear is that new approaches and analyses will be rejected because of their uncertainties or demands for institutional resources unless things are done in small steps. Another concern is if the Council moves forward on new things, other things will need to be pushed aside. For example, when the North Pacific FMC did their Groundfish Programmatic Supplementary Environmental Impact Statement, some stock assessments didn't get done. Managing the increased workload will definitely be an issue, but shouldn't be an excuse to shy away from making progress.

To avoid a false sense of security, it should be understood that these aren't simple matters, and it is estimated that multiple-years will be required for implementation, testing, and adaptation.

However, there are ways of moving forward with all the elements outlined above. As a start, it will be important for the Councils to create and implement a process and institutional structure that will facilitate the identification of a broader set of goals and operational objectives that deal with concerns beyond the targeted fish species. Once the goals and objectives are clearly identified, the Councils can start by choosing the actions that can be done where the outcome reasonably can be assumed, i.e. 'if we do this, that will probably happen'. There are also activities in the Panel's list that could be implemented immediately, but there are limitations due to the unknown quality of the models. An important application of these models is to identify areas of high uncertainty and guide research or data collection to fill in these gaps. Therefore, despite the limitations, it is still important to generate these conceptual models. If a model is inaccurate and/or imprecise, its high uncertainty level will be noted, and will indicate where work is needed to improve its performance.

These models will evolve over time from population models (single species) to community models (taking into account food web considerations) and ecosystem models (taking into account environmental considerations such as habitat and climate). Additionally, as research progresses, the fishery management approach will evolve from implicit and non-quantitative consideration of the ecosystem to a more specific and explicit quantification of these features. It will also progress from consideration of these factors "outside" the fishery assessment itself to a system where these factors are fully integrated into the assessment and management process (Goodman et. al 2002). (Also see Appendix 4 for more information.)

The Role of Science in Fisheries Management

The panel also addressed a second and related topic: the role of science in fisheries management. To do so, they commented on four questions.

The first question was:

4. What is the appropriate role of science in fisheries management? How will this change as management programs move increasingly towards ecosystem based approaches?

The role of science is to inform the management decision process. The Science and Statistical Committees provide the Fishery Management Councils with reviews of documents, identify research issues and needs, and provide advice on conservation and management issues. The role of science with the implementation of ecosystem-based management will be the same. However, the breadth of information supplied by science will expand. The ability to use ecosystem approaches to sustain marine fisheries will depend on better information.

As management programs move towards ecosystem-based approaches, the role of science is to: facilitate the implementation of a decision analysis framework, to provide advice on drafting management procedures, use management strategy evaluations for contrasting and evaluating management procedures, and to provide data driven inputs (e.g. stock assessments with uncertainty quantification).

The second question regarding the role of science in fishery management was:

5. How do the scientists and the Councils interact now at the North Pacific and Pacific Fishery Management Councils ? What are the current institutional arrangements?

A detailed description of how the Pacific and North Pacific FMCs SSCs operate was prepared for the Managing Our Nation's Fisheries II Conference held in Washington, DC. (Witherell, 2005) is found in Appendix 5. The panel emphasized the following characteristics:

The institutional setting of the management process that both the North Pacific and Pacific Fishery Management Councils (FMCs) use is characterized by consideration of science as an integral part of the process. A tier approach best characterizes the way these FMCs receive scientific advice. The Plan Teams (PT), called Technical Teams in the Pacific FMC, represent the first layer. These groups are made up of academic, federal and state agency scientists. Each fishery management plan has a PT. They provide the FMC with reviews and allowable biological catch (ABC) information, and other information upon the request of the FMC.

The Scientific and Statistical Committee (SSC) is the second tier. As with the PTs, the SSCs are made up of academic, federal and state agency scientists. The North Pacific SSC has an equal split of agency and academic representatives. An effort is made in the North Pacific FMC to have all relevant disciplines represented on the SSC so that the Council is informed of how management might impact the various marine resources in the Bering Sea and Gulf of Alaska. The Pacific Council's SSC has more non-academic (agency) representatives. At the request of the Councils, the SSCs provide critical review of documents, advice on research issues and advice on conservation and management issues. They also review the models and methods used by the PTs. On occasion, the SSCs have taken the initiative to provide advice on issues considered to be of importance to decision making[8]. However, the usual approach is for the Councils to seek information from the SSCs[9]. Meetings of the SSCs are scheduled to occur concurrently with each FMC meeting to promote dialogue which will foster science based management.

Outside scientists make up the third tier. The North Pacific FMC has used outside scientists and the Center for Independent Experts (CIE) to review scientific documents, stock assessments, and its groundfish harvesting strategy. The Pacific FMC has used outside scientists, including scientists selected by the CIE, during the FMC-sponsored stock assessment review process (STAR panels) and in the harvest policy review workshop.

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[8] The North Pacific FMC's SSC for example provided a recommendation to implement an observer program for groundfish, held a workshop on multispecies management, and conducted a socio-economic study for the crab fishery limited entry plan. The Pacific FMC's SSC prepared a white paper on overcapitalization and conducted a harvest policy workshop.

[9] For example, at the request of the Pacific FMC, the SSC provided an evaluation of Marine Protected Area (MPA) objectives, rationales, fishery management implications and regulatory requirements.

The third question regarding the role of science in fisheries management was:

6. Are current institutional arrangements adequate to address the challenges of ecosystem based approaches to management? Should SSCs be separated and insulated from the Fishery Management Councils? Or should the working relationship be strengthened through closer ties between the SSCs and the Councils? What practical steps can be taken to strengthen the role of science in fisheries management? Are there steps that the Councils or the Secretary can take now? What about the longer term?

The structure, process and use of Science and Statistical Committees (SSCs) by regional fishery management councils (FMCs) vary. In the case of the North Pacific and Pacific FMCs, the panel believes that the institutional process used to deal with scientific information is working. The decision making process is science-based and their scientific review bodies (SSCs, Plan Teams) are active, visible, and important in the management process. Nevertheless, ecosystem-based fishery management will require the development of a more formal process governing trade-offs between competing objectives, and methods for explicitly dealing with high levels of uncertainty. Estimates of uncertainties will also be required, as these are inputs into the decision rules, and the SSCs will be involved in identification of methods that can be used to address uncertainty. Further, there will be a need to conduct and review Management Strategy Evaluations (MSEs). None of these steps are easy, and they will all require a lot of additional technical work. Though the institutional structure of the SSC is adequate, additional staffing will be needed, especially to conduct these MSEs. The existing disciplinary expertise may need to be examined to assure the presence of appropriate representation for the broader EBFM goals.

The panel believes that SSCs should not be separated and insulated from the FMCs. Fisheries are not managed by science alone, but good fishery management cannot afford to ignore good science, and needs ready access to it. There will always be policy choices and tradeoffs that may be within the scope of the discretionary authority of the FMC, but the FMC will be in a position to better use that latitude if the SSC informs the FMC of the probable consequences of their choices. A close working relationship of a FMC with its SSC, which can be fostered by having both bodies meet at the same time, will facilitate such communication.

The Panel also suggested that the role of science and, thus, the SSCs, would be strengthened if NOAA Fisheries and the Secretary of Commerce would ask for a rigorous justification from the FMC if decisions were contrary to scientific advice. It should be made clear that SSC members are to act independently as scientists (and at times may disagree with their agency positions). Additionally, there may be value in having periodic national or regional meetings of the SSCs to develop common operating procedures and to compare approaches to providing scientific advice

The last question regarding the role of science in fisheries management was:

7. The issue of the role of scientists in setting overall harvest levels is a fundamental question facing all fishery management councils nationwide. The North Pacific Fishery Management Council (FMC) has a long policy of having the SSC set the allowable biological catch (ABC) and the Council then setting catch levels (total allowable catch, TAC) at or below ABC [10]. Under what conditions (if any) should a FMC set catch levels (TAC) higher than the levels (ABC) recommended by the scientists? What institutional checks and balances (if any) or review procedures (e.g. peer review) should be in place prior to allowing any Council to exceed the scientifically recommended harvest levels?

In many parts of the United States, there has been long-standing concern with how science is used in the Council process. The 1986 Calio Report found that "fishery management will be markedly improved by a clear separation between conservation and allocation decisions." It recommended further that NOAA should determine ABCs using the best available science along with local and regional expertise, and Councils should make allocations that could not exceed the ABCs. Similar proposals have occurred almost continuously since then. Recently, the U.S. Commission on Ocean Policy (USCOP 2004) stated that, "...a lack of adequate scientific information has not been the main culprit in most instances of overfishing" and suggested that the SSCs set the allowable biological catch level and require the Councils to set harvest limits for the various fishing interests at or below this amount.

In a paper submitted for a Regional Fishery Management Council workshop, the executive director of the New England FMC (Howard, 2004) argued that decisions on such technical issues as annual catch limits and status determination criteria require an evaluation of risk to both stocks and fisheries. Further, he stated that risk evaluation is the responsibility of managers, not agency scientists. He commented that with its varied expertise, the Council considers the scientific recommendations, discusses the level of risk associated with various alternatives, and makes a management decision.

At the Fishery Management Conference held this past March in Washington, D.C. the Conference science panel (Conference's SSC) commented that important roles for SSCs in the specification of ABCs include peer review of the stock assessments and harvest formulas that are used to calculate ABC, and review of regulatory analysis describing relevant effects (including the extent of risk and uncertainty) of harvest alternatives (Witherell, 2005). That Committee noted that while computation of an ABC is a scientific process, how it is derived is based on formulations that already reflect policy choices. The Main Conference Panel stated that the FMCs should adopt the ABC determined by their SSCs and set the total allowable catch (TACs) at or below the ABC (Witherell, 2005).

At the same Conference, the Conference's science panel noted that defining and using the best scientific information available is an important goal in conducting fisheries science and

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[10] There are various definitions of TAC and ABC. The Pacific FMC uses the following:
TAC (Total allowable catch). The total regulated catch from a stock in a given time period, usually a year.
ABC (Acceptable biological catch). The ABC is a scientific calculation of the sustainable harvest level of a fishery and is used to set the upper limit of the annual total allowable catch. It is calculated by applying the estimated (or proxy) harvest rate that produces maximum sustainable yield to the estimated exploitable stock biomass (the portion of the fish population that can be harvested).

implementing fishery management objectives. It was stated also that having the best available science doesn't necessarily mean that it will be used. It was suggested that existing institutional mechanisms should be strengthened, for example, by having the Secretary of Commerce examine if management is consistent with scientific advice. This could be done, for example, as part of the Environmental Impact Statement (EIS) review. For instance, EISs prepared by the FMCs in setting their annual specifications could be required to include an explicit discussion of whether FMC recommendations deviated from SSC advice and why.

To assure that the best available scientific information is used, the National Research Council (2004) recommended that NOAA Fisheries should develop and implement guidelines on the production and use of scientific information in the fishery management process. It suggested that the guidelines be based on criteria of relevance, inclusiveness, objectivity, transparency and openness, timeliness and peer review. The panel agreed that such guidance would be helpful.

The Panel also agreed that, while computation of an ABC is a scientific process, some of the key constraints in the calculation may be set by policy. In the future, as decision rules become more sophisticated, the quantification of uncertainty will become more formalized. That is the stipulation of risk-related policy, namely the specification of how risk averse or risk tolerant the decision process should be, will become increasingly important. The formulation of such policy is not the role of scientific advisory bodies such as SSCs, but it should not be left to ad hoc decisions of the moment either (e.g. where within the range of values provided by the Pacific Council's SSC is the appropriate ABC). The goal of such formalized policy is to achieve consistency and stability across time and across districts, serving the best interest of society as a whole, in the long run, and putting more distance between the decision process and narrower considerations of expediency. For this reason, such policy should be the subject to national debate and independent scientific peer review. Regional differences must be recognized. Within such a framework, with its heavy technical demands, the role of scientific advisory bodies, such as SSCs, is to provide scientific quality control and quality assurance to the implementation. This role will include assuring that policy-determined constraints with respect to risk are met.

The Panel believes that important roles for the Scientific and Statistical Committees (SSC) in the specification of acceptable biological catch (ABC) include peer review of the stock assessments and harvest formulas that are used to calculate ABCs, and review analyses describing effects (including the extent of risk and uncertainty) of harvest alternatives and other management measures.

Both the Pacific and North Pacific Fishery Management Councils (FMCs) have attempted to be precautionary in their selection of harvest strategies. They have consistently set the total allowable catch (TAC) below ABC, thereby showing that they incorporate scientific advice into their harvest strategies. An interesting distinction is that the North Pacific SSC provides their FMC with a point estimate of ABC for a given stock, while the PFMC SSC provides a range of values for ABC. Further, the Pacific FMC reduces ABC linearly as fish biomass drops. In contrast, the North Pacific FMC reduces fishing mortality linearly as fish biomass drops, which results in a quadratic decrease in ABC. Ample scientific evidence exists to show that these biomass-based reductions serve to reduce the risk of over-harvesting and the time to rebuild to the target level of biomass. Management strategy evaluations should be conducted by the Councils to ensure that the use of either approach (point estimates or ranges of values) is suitably precautionary.

When a FMC selects a TAC from a range of ABC values, there should be sufficient justification and documentation for the choice. The Panel believes that TACs should be set above the value recommended by the SSC only when independent and credible peer review reveals fundamental flaws in a stock assessment analysis. The panel believes NOAA Fisheries and the Secretary of Commerce should be more diligent in their review of the actions taken by the FMCs.

Conclusion

The Panel addressed a series of questions that were designed to obtain advice on two questions related to the work of Fishery Management Councils (FMCs), and particular the North Pacific and Pacific FMCs. One set of questions related to the means by which FMCs could move further forward with an ecosystem-based fishery management (EBFM) approach; the other set of questions related to the role of science in fishery management in general and how this might change to meet the challenges of EBFM.

The Panel was able to provide practical suggestions regarding the elements and steps that can be taken to transition from a predominantly single-species approach, with some limited consideration of ecosystem factors, to a fully specified and integrated EBFM approach. This will not involve starting anew, but will move incrementally forward. This will involve recognition of a broader set of societal goals so that the desires of a larger group of users are addressed. It will also involve considering food web interactions, various spatial scales, climatic and oceanographic variations, the role of habitat, and the higher degree of uncertainty involved in these factors. It will also require new monitoring work to provide information on non-target species and other environmental factors. Similarly, there will be a need for new modeling and research to provide data and reduce the uncertainty involved in employing new management strategies. This will take commitment of additional resources and funding. The Panel also suggested a checklist of steps that could be followed to further EBFM considerations, including steps such as developing an integrated ecosystem model, developing indicators of ecosystem health and a program to monitor these indicators, developing decision rules based on the indicators, and defining, evaluating, and revising various management strategies to better meet goals. Though the level of detail and data available will change over time, the considerations identified can be applied in both the short term and long term.

The Panel commented on the role of scientific input in the FMC process. They noted that the existing process was working well in the North Pacific and Pacific. With EBFM there will be a need for additional resources and expertise to develop expanded decision rules, evaluate risk, and conduct management strategy evaluations to determine the basis for the eventual policy choices. The Panel believes that maintaining and strengthening ties between the Scientific and Statistical Committees (SSCs) and their respective FMCs, rather than severing them, as has been suggested, was important in assuring a scientific basis for fishery management, provided clarity about their respective roles is maintained and the scientific independence of the SSCs is upheld. Membership on the SSCs will need to be expanded to include individuals with expertise necessary for implementing EBFM.

References

Beamish, R.J., ed. 1995. Climate Change and Northern Fish Populations. Canadian Special Publication of Fisheries and Aquatic Sciences 121: 1-739.

Busch, W.-D.N., B.L. Brown, and G.F. Mayer (Eds). 2003. Strategic guidance for implementing an ecosystem-based approach to fisheries management. United States Dept. of Commerce, NOAA, National Marine Fisheries Service, Silver Spring, MD. May 2003.

Caddy, J.F. 2002. "Limit Reference Point, Traffic Lights, and Holistic Approaches to Fisheries Management with Minimal Stock Assessment Input." Fisheries Research 56: 133-137.

Dayton, P., S. Thrush, S. and C. Coleman. 2003. Ecological Effects of Fishing in Marine Ecosystems of the United States. Pew Oceans Commission. May 2003.

FAO Fisheries Department. 2003. The ecosystem approach to fisheries. *FAO Technical Guidelines for Responsible Fisheries*. No. 4, Suppl. 2. Rome, FAO. 2003. 112 p.

Field, J and R. Francis. 2005. Considering ecosystem-based fisheries management in the California Current. In review : Progress in Oceanography.

Field, J.C., R. Francis, and K. Aydin. 2005. Top down modeling and bottom up dynamics: lining a fisheries-based ecosystem model with climate hypotheses in the Northern California Current. In review: Marine Policy.

Fogarty, M.J., and Murawski, S.A. 1998. Large-scale disturbance and the structure of marine systems: fishery impacts on Georges Bank. Ecol. Appl. 8 (Suppl.): S6-S22.

Goodman, D., M. Mangel, G. Parkes, T. Quinn, V. Restrepo, T. Smith, K. Stokes. 2002. Scientific review of the harvest strategy currently used in the BSAI and GOA groundfish fishery management plans. Prepared for North Pacific Fishery Management Council. November 2002.

Holliday, Mark. 2004. Guidelines for Regional Marine Ecosystem Approaches to Management. Current Issues in Implementing the Magnuson-Stevens Fishery Conservation and Management Act; A workshop for members of the Regional Fishery Management Councils, Baltimore, MD, October 2004

Howard, Paul. 2004. Governance Role of Fishery Management Councils under Regional Ecosystem Management. Current Issues in Implementing the Magnuson-Stevens Fishery Conservation and Management Act; A workshop for members of the Regional Fishery Management Councils, Baltimore, MD, October 2004.

Lent, Rebecca. 2004. Ecosystem Approaches to Fisheries. Current Issues in Implementing the Magnuson-Stevens Fishery Conservation and Management Act; A workshop for members of the Regional Fishery Management Councils, Baltimore, MD, October 2004

McGinn, N.A., ed. 2002. Fisheries in a Changing Climate. American Fisheries Society, Sumposium 32: 1-295.

McLeod, K.L., J. Lubchenco, S.R. Palumbi, and A.A. Rosenburg. 2005. Scientific Consensus Statement on Marine Ecosystem-Based Management. Signed by 217 academic scientists and policy experts with relevant expertise. Communication Partnership for Science and the the Sea (COMPASS).

Mueter, F.J. and B. Megrey. 2005. Using aggregate surplus production models to estimate ecosystem-level maximum sustainable yields. FOCI-0545 NOAA's Fishery-Oceanography Coordinated Investigations.

Murawski, Steve. 2004. Fishery Management and the Best Scientific Information Available (BSIA). Current Issues in Implementing the Magnuson-Stevens Fishery Conservation and Management Act; A workshop for members of the Regional Fishery Management Councils, Baltimore, MD, October 2004

National Marine Fisheries Service (NMFS). 1999. Ecosystem-based Fishery Management: A Report to Congress by the Ecosystems Principles Advisory Panel.

National Research Council (NRC). 1999. Sustaining Marine Fisheries. National Academy Press, Washington, D.C.

National Research Council (NRC). 2004. Improving the Use of the "Best Scientific Information Available" Standard in Fishery Management, National Academy Press, Washington, D.C.

NOAA 1986 (the Calio Report). U.S. Dept. of Commerce. *NOAA Fishery Management Study.* Washington, DC: June 30, 1986.

Pew Oceans Commission. May 2003. Managing Marine Fisheries in the United States. Proceedings of the Pew Ocean Commission Workshop on Marine Fishery Management.

Quinn, T.J., II. 2003. Ruminations on the development and future of population dynamics models in fisheries. Natural Resource Modeling 16: 341-392.

Quinn, T.J., II, and Deriso, R.B. 1999. Quantitative Fish Dynamics. Oxford University Press, New York.

Quinn, T.J., II, and Collie, J.S. 2005. Sustainability in single-species population models. Philosophical Transactions of the Royal Society B 360: 147-162.

Sissenwine, M.P., and Mace, P.M. 2001. Governance for responsible fisheries: an ecosystem approach. In Responsible Fisheries in the Marine Ecosystem (M.Sinclair and G. Valdimarsson, eds.), CABI Publishing, Wallingford, England: 363-390.

South Atlantic Fishery Management Council. 2004. Action plan. Ecosystem-based management: evolution from the habitat plan to a fishery ecosystem plan.Charleston, South Carolina. December 2004.

U.S. Commission on Ocean Policy Report. 2004. An Ocean Blueprint for the 21st Century. Final Report. Washington, D.C.

Witherell, D., editor 2005. Focusing on the Future; Managing Our Nation's Fisheries II, Washington, D.C. Summary of findings from a conference held in Washington, D.C., March 2005.

Witherell, D., editor. 2004. Managing our nation's fisheries: past, present and future. Proceedings of a conference on fisheries management in the United States held in Washington, D.C., November 2003.

Witherell, D., C. Pautzke and D. Fluharty. 2000. An ecosystem-based approach for Alaska groundfish fisheries. ICES Journal of Marine Science 57:771-777.

Appendix 1
Biographies of the Panel Members

Dr. Daniel Goodman: Dr. Goodman received has PhD from Ohio State University in 1972 and did post-doc work at Cornell University 1972-74. He worked as an Assistant Professor of Population Biology at Scripps Institution of Oceanography 1975-1983 and as an Assistant Professor of Biology at Montana State University 1981-1987. Since 1987 he has been a Professor of Biology at Montana State University His research includes work on population modeling, environmental statistics, Bayesian decision theory, population viability analysis, marine mammal conservation, and salmon fisheries management. He has published over 80 reports on this work.

He has served on numerous national and international science panels. Among other work, he served, between 1987 and 1994, on various Science Advisory Boards of the US Environmental Protection Agency including the research strategies subcommittee, long-term ecological research subcommittee, a global climate research subcommittee, and an ecological processes and effects committee. He has served on the Independent Science Advisory Board for Salmon Recovery and the Independent Scientific Review Panel of the Northwest Power Planning Council since 1996 and 1997, respectively. Since 2002 he has also served on National Marine Fisheries Service's (NMFS) Hawaiian Monk Seal Recovery Team.

He served as chairperson for the Review Panel for the Groundfish Fishery Control Rule for the North Pacific Fishery Management Council in 2002. Since 2002 he has also been a member of the Science Panel for the North Pacific Research Board.

Dr. Churchill Grimes: Dr. Grimes is the Director of the NMFS Southwest Fishery Science Center, Fishery Ecology Division in Santa Cruz, CA, where he directs the research program to provide the scientific basis for conservation and management of demersal fishery resources and the recovery and restoration of ESA listed anadromous species in California. Prior to assuming his present position Dr. Grimes served as Director and as Leader of Fishery Ecology Investigations of the NMFS, Southeast Fishery Science Center, Panama City Laboratory and was Associate Professor of Marine Fisheries at Rutgers University in New Brunswick, NJ.

He has published over 100 papers, on his research on life history and population dynamics (in particular habitat ecology, recruitment processes and fishery oceanography) of various fishery resources in the Southern New England-Mid Atlantic Bight, U.S. South Atlantic Bight, Gulf of Mexico and Pacific Ocean off California.

He has served on numerous international, national and regional scientific advisory bodies. In 1987 he participated in developing the NMFS Ecosystem Initiative, throughout the 1990's he served on the Gulf of Mexico Fishery Management Council Scientific and Statistical Committee (SSC) and the Special Mackerel SSC, published papers on the utility of the Experimental Oculina Research Reserve off southeast Florida for managing reef fish stocks and on the use of marine reserves for fishery management. He also served on the steering committee of the American Fishery Society Symposium on Aquatic Protected Areas as Fishery Management Tools, organized and participated in the National Fisheries Conservation Center MPA Science Integration Workshop, and was the principal organizer of the NOAA MPA Science Integration Working Group process.

Dr. Peter Lawson: Dr. Lawson is currently a research fishery biologist at the NMFS Northwest Fisheries Science Center. He received an M.S. in 1984 and Ph.D. in stream ecology from Idaho State University in 1986. He then took a position as biometrician and modeler for the ocean salmon harvest team of the Oregon Department of Fish and Wildlife. In 1997, after ten years with ODFW, Pete joined NMFS.

He has served on technical advisory committees to the Pacific Fishery Management Council (PFMC) and the Pacific Salmon Commission since 1987. He served a two-year term as chair of the PFMC's SSC and several terms as vice-chair. He is currently chair of the SSC's salmon subcommittee.

Pete's models have been used to predict salmon runs, estimate harvest impacts, elucidate the non-landed mortality in selective fisheries, and explore coho salmon population dynamics with a fine-grained, habitat-based life-cycle model. Recent publications have treated climate effects on coho salmon survival in both freshwater and marine environments, with the goal of building a model that integrates across freshwater and marine phases of the life cycle.

Dr. Richard Marasco: Dr.Marasco received his bachelor's degree in 1965 from Utah State University in Applied Statistics and Computer Science. He received his doctor's degree from the University of California Berkeley in Agriculture and Natural Resource Economics is 1969. He served on the staff of the Agriculture and Natural Resource Economics of the University of Maryland from 1969 to 1977.

From 1977 to 2005, he served on the staff of the NMFS Alaska Fisheries Science Center, in Seattle, Washington. From 1981 to 2004 he was the Director of their Resource Ecology and Fisheries Management Division.

He was the U.S. delegate to PICES (North Pacific Marine Science Organization) from 1999-2004 and the chairman of its finance and administration committee from 1998 to 2004.

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He also served on the North Pacific Fishery Management Council's Science and Statistical Committee from 1979 to 2004. He served several terms as Chairman of that body. Since 2002 he has also been Chairman of the Science Panel for the North Pacific Research Board.

Dr. André Punt: Dr André Punt is an Associate Professor with the School of Aquatic and Fisheries Sciences, University of Washington, Seattle and a Research Scientist with CSIRO Marine and Atmospheric Research in Hobart, Australia. He holds an M.S. and a Ph.D. in Applied Mathematics from the University of Cape Town, South Africa. André has been involved in research on marine population dynamics, stock assessment methods, and harvesting theory since 1986, and has published over 100 papers in the peer-reviewed literature along with over 300 technical reports. His current research focuses on the performance of stock assessment methods, application of Bayesian approaches in fisheries assessment and decision analysis, and management strategies for fish and marine mammal populations.

Until early 2001, when he left Australia to join the University of Washington, André was chair of Australia's Southern Shark Fishery Assessment Group and a member of the Shark Fishery Management Advisory Committee. He has been a member of several other stock assessment teams and is currently an at-large member of the Scientific and Statistical Committee of the Pacific Fisheries Management Council. He is also a member of the IUCN Shark Specialist

Group, participated in the review of the IUCN criteria for listing species at risk of extinction, and is currently a member of the IUCN Red List Standards and Petitions Committee.

André has participated in the Scientific Committees of the International Commission for the South East Atlantic Fisheries (ICSEAF) and the International Commission for the Conservation of Atlantic Tunas (ICCAT). He has been an invited participant to the International Whaling Commission (IWC) since 1990.

Dr. Terry Quinn II: Dr. Quinn received a BA in Mathematics from the University of Colorado in 1973, and an MS in Fisheries in 1977 and a PhD in Biomathematics in 1980 from the University of Washington. From 1977 to 1985 he was Biometrician at the International Pacific Halibut Commission. Since 1985, Dr. Quinn has served as a professor of Fish Population Dynamics at the University of Alaska Fairbanks.

He is the co-author or co-editor of 4 books, including the key reference for fishery models: Quantitative Fish Dynamics, with co-author Richard B. Deriso, published by Oxford University Press. He has also written about 100 peer-reviewed scientific publications. He has shepherded about 25 students through their post-graduate careers at either the M.S. or PhD levels.

He has been a member of the Statistical and Scientific Committee of the North Pacific Fishery Management Council since 1986 and is a former chairperson of that body. He is a former member of the Ocean Studies Board of the National Academy of Sciences and served on five of their committees, and has served as the chairperson or co-chairperson of two of these. He is an Associate Editor of the prestigious Canadian Journal of Fisheries and Aquatic Sciences.

Support Staff

Dave Hanson is the deputy director of Pacific States Marine Fisheries Commission (PSFMC). He is a non-voting member of both the Pacific and North Pacific Fishery Management Councils, and is currently chairman of the Pacific Council's Legislative Committee and Parliamentarian. He has been involved in the development of inter-jurisdictional fishery management plans for West Coast fisheries and has been involved in many international fishery issues for PSMFC.

Fran Recht is the habitat program manager for the PSMFC. She serves on the habitat committee of the Pacific Fishery Management Council, is involved with watershed restoration, protection, and education efforts, and was recently involved in helping prepare sections of the groundfish essential fish habitat document.

Jodie Little is a graduate student at the University of Washington's School of Aquatic and Fishery Sciences, working under the direction of Dr. Robert Francis. Her doctoral studies focus on modeling and evaluating interactions between the U.S. West Coast coastal marine ecosystem, economies and coastal communities.

Appendix 2: Questions for Panel

1. Ecosystem based Management

The United States Commission on Ocean Policy (USCOP) recommends moving towards an ecosystem-based approach to management but recognized that our limited knowledge of the marine environment and ecosystem relationships is a major hurdle. The National Research Council (NRC), also recognizing these limits, proposed eight specific elements of an ecosystem-based approach to fisheries management which could be used as guidelines in sustainable fishery management by regional management councils. Questions for Panel consideration include:

- **What is a practical definition of an ecosystem-based approach to fisheries management that could be used by fishery management councils?**

- **What are the characteristics or management elements of an ecosystem based approach to fisheries management? Are the elements identified by the NRC/EPAP still appropriate? Are there other elements or characteristics that should be included?**

- **Are there practical ways for the North Pacific and Pacific Fishery Management Councils to incorporate these elements or characteristics further into their respective fishery management programs? How can these Councils improve their incorporation of ecosystem factors in their decision making in the near term? What longer term changes are needed?**

2. Role of Science in Fisheries Management

With the emphasis of moving more and more towards an ecosystem based approach to fisheries management, the role of science will be increasingly important. The USCOP called for separating the scientists (SSC) from the managers (Councils) to separate "conservation" decisions from "allocation" decisions. Others have called for strengthening the interactive role of science and management, arguing that a stronger institutional tie between science and management provides for better informed decision making. At the recent Managing Our Fisheries II Conference, the panel on Science and Management called for the scientists to set the overall harvest level and limiting the Council decisions to setting final harvest levels at or below the level recommended by the scientists. This was modified by the final Panel to allow for exceeding the ABC only with appropriate justification. Questions for consideration by the Panel include:

- **What is the appropriate role of science in fisheries management? How will this change as management programs move increasingly towards ecosystem based approaches?**

- **How do the scientists and the Councils interact now at the NPFMC and PFMC? What are the current institutional arrangements?**

- **Are current institutional arrangements adequate to address the challenges of ecosystem based approaches to management? Should the SSCs be separated and insulated from the Councils? Or should the working relationship be strengthened through closer ties between the SSCs and the Councils?**

- **What practical steps can be taken to strengthen the role of science in fisheries management? Are there steps that the Councils or the Secretary can take now? What about the longer term?**

- **The issue of the role of scientists in setting overall harvest levels is a fundamental question facing all fishery management councils nationwide. The NPFMC has a long policy of having the SSC set the ABC, and the Council then setting the TAC at or below ABC. Under what conditions (if any) should a Council set catch levels (TAC) higher than the levels (ABC) recommended by the scientists? What institutional checks and balances (if any) or review procedures (e.g. peer review, others) should be in place prior to allowing any Council to exceed the scientifically recommended harvest levels?**

Appendix 3: Management Elements Suggested by EPAP/NRC

Both the Ecosystem Principles Advisory Panel (NRC 1999) and the National Research Council (NRC 1999) have suggested various methods to achieve ecosystem-based management (see below). Some of the mechanisms suggested include accounting for the total amounts and kinds of species caught (bycatch), managing single species conservatively, reducing excess fishing capacity, establishing marine protected areas, and employing alternative fishing gears and using various management areas to reduce impacts. The panel considered many of these suggestions to be useful tactical approaches, rather than strategic elements, and ones that could help meet EBFM objectives, but that were not necessarily confined to an EBFM approach. They also noted an absence of quantitative specificity in these approaches.

For example, the North Pacific and Pacific FMCs have already adopted or are considering tactics to manage conservatively, reduce capacity, protect habitat and forage fish. The North Pacific in particular has employed most of these methods. However one doesn't know if these methods are enough to achieve the strategic goals; i.e. it doesn't necessarily answer the question "are we doing enough"?

ECOSYSTEM-BASED FISHERY MANAGEMENT APPROACH RECOMMENDATIONS (summarized)

National Research Council report—Sustaining Marine Fisheries (NRC 1999)	***Ecosystems Principal Advisory Panel (NMFS 1999)***
Incorporate ecosystem goals into management	Develop an overall Fisheries Ecosystem Plan (FEP) that involve Councils taking 8 actions[11]
conservative single species management	Estimate MSY and set OY conservatively
account for uncertainty to favor long-term goals	Make risk adverse decisions, err toward conservation (apply precautionary approach)
	change the burden of proof when effects are poorly known (no expansi fisheries/catch levels, no development/promotion of fisheries for undei species)
reduce excess fishing capacity	
establish marine protected areas	marine protected areas/reserves as insurance
	develop system to detect & respond to adverse impacts at early stage
Incorporate bycatch and discards in setting catch (TAC)	consider total bycatch removals, understand by gear type, temporal and spatial distribution;
Management/incentives to favor gears and technology that promote conservation	id existing or potential alternative gear types or fishing patterns such as area closures to alleviate habitat impacts; reduce bycatch
develop institutions to achieve goals; provide appropriate socioeconomic incentives	local incentives through share-based allocations (IQs, units of fishing effort, rights to fish specific areas etc.)
conduct research/get info on marine ecosystems, models, socioeconomics	support on-going comprehensive ecosystem research and expand it to include research to determine the ecosystem effects of fishing, monitor trends and dynamics of marine ecosystems, and ecosystem-based approaches to governance.
	Promote maximum involvement of stakeholders in fishery management, including the interests of future generations, and maximum appropriate delegation of responsibility to the lowest levels of the management system (i.e. local or regional level)
Provide ecological principles training to Council members/staff	

[11] The actions include: delineating and characterizing each ecosystem; developing a conceptual model of the food web; etc. (see full listing under question 3 of this document).

Appendix 4
Excerpts From Scientific Review Of The Harvest Strategy Currently Used In The BSAI And GOA Groundfish Fishery Management Plans (Goodman et. al 2002)

Summary of the information on moving from conventional fisheries assessments to assessments that explicitly incorporate ecosystem considerations

Given sufficient investment in carefully designed experiments and monitoring to improve the predictive power of the models, they will evolve over time from population models (single species) to community models (taking into account food web considerations and environmental considerations such as habitat and climate).

Additionally, as research progresses, the fishery management approach will progress from implicit and non-quantitative consideration of ecosystem considerations to more specific and explicit quantification of these considerations. It will also progress from consideration of these factors "outside" the fishery assessment itself to a system where these factors are fully integrated into the assessment and management process.

This process is conceptualized as occurring in stages. In the first stages (a single species focus), consideration is focused on the status of the target species and its predators and prey (as well as the socio-economic world of the fishing community which takes the stock) in an implicit way. "Safety margins" or buffers are built in to account for non-target species. This then progresses to more specific and explicit accounting for the environmental effects on the status of target species, with measures incorporate to account for the direct effects of fishing on the other non-target species (e.g. bycatch and incidental mortality). That is, the status of prey and predators are considered in setting the catch limit in the management procedure, but the analyses are not integrated with the analyses that focus on the target species.

In the second stages of explicit consideration of ecological and ecosystem effects, management procedures take into account the status of the target stock, predator and prey species, and some environmental information such as direct effects of fishing for the target species on EFH and bycatch. The mitigation of the direct effects of the fishery is addressed through such things as bycatch reduction devices, habitat protection measures, and taking into account the prey needs of other species. At this stage too, the analysis of these factors are also separate from the analytical process for the target species (that is there is no direct link made between the fishery and its effects on ecosystem properties or the effects of the environment on the ecosystem other than the direct effects on the target population). The North Pacific FMC, for example, has produced an annual report on ecosystem considerations to be incorporated into each year's Stock Assessment and Fishery Evaluation (SAFE) reports. This provides the FMC with information about the oceanographic conditions in the Bering Sea and Gulf of Alaska and the effects of environmental change on fish stocks, information on predator/prey interactions, and forecasts the ecosystem impacts of fishery management decisions. This information may limit the catch of target species, based on the ecosystem goals that Council has adopted, but the stock assessment and estimation of yield of the target species is still undertaken essentially in isolation of ecosystem considerations.

In the third stage, community ecology is directly incorporated into the analytical process for management of the target species, with information from the environment, including information about non-target species, integrated directly into the assessment process so that it directly influences the scientific advice provided to the Council. At this state there is a higher level of uncertainty in some factors (such as climatic regimes and inter-annual variation) and where indirect effects of fishing are more broadly considered (e.g. where cause and effect may be several steps removed from each other). Recognizing the high level of uncertainty and predictive power of these integrated models, there will also be a need to use additional techniques such as risk analysis and adaptive management to allow action in light of this uncertainty and the possibility of errors.

The following figures are from the Goodman et al. 2001 report:

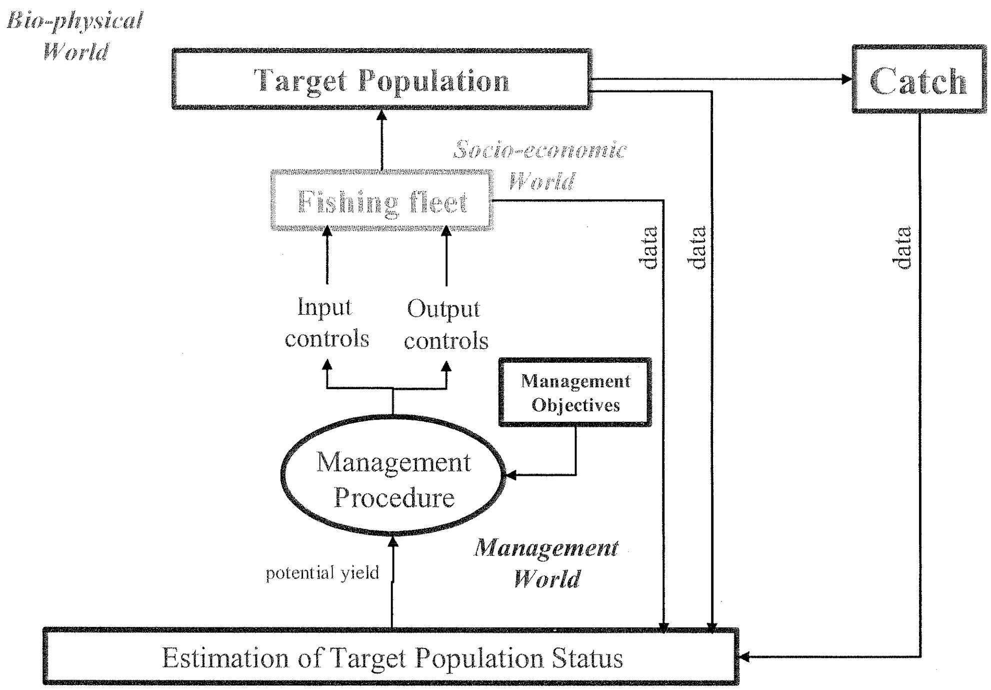


Figure 4.1. The conventional assessment world view, in which nearly all fishery management is currently done, recognizes the biophysical world in which the stock exists, the socio-economic world of the fishing community that takes the stock, and the management world in which catch limits are determined.

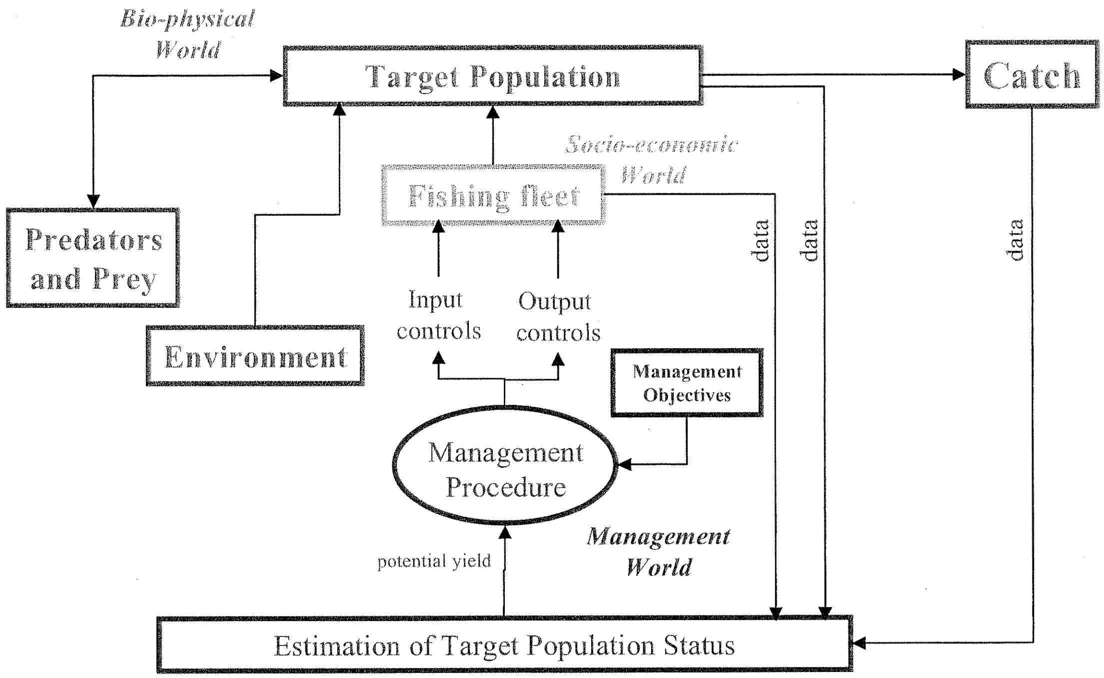


Figure 4.2. In the implicit ecosystem effects world view, we recognize that target species in fisheries are generally prey for other components of the ecosystem. While management objectives only take such predator needs into account in a very general way, the implicit view is cognizant of those needs.

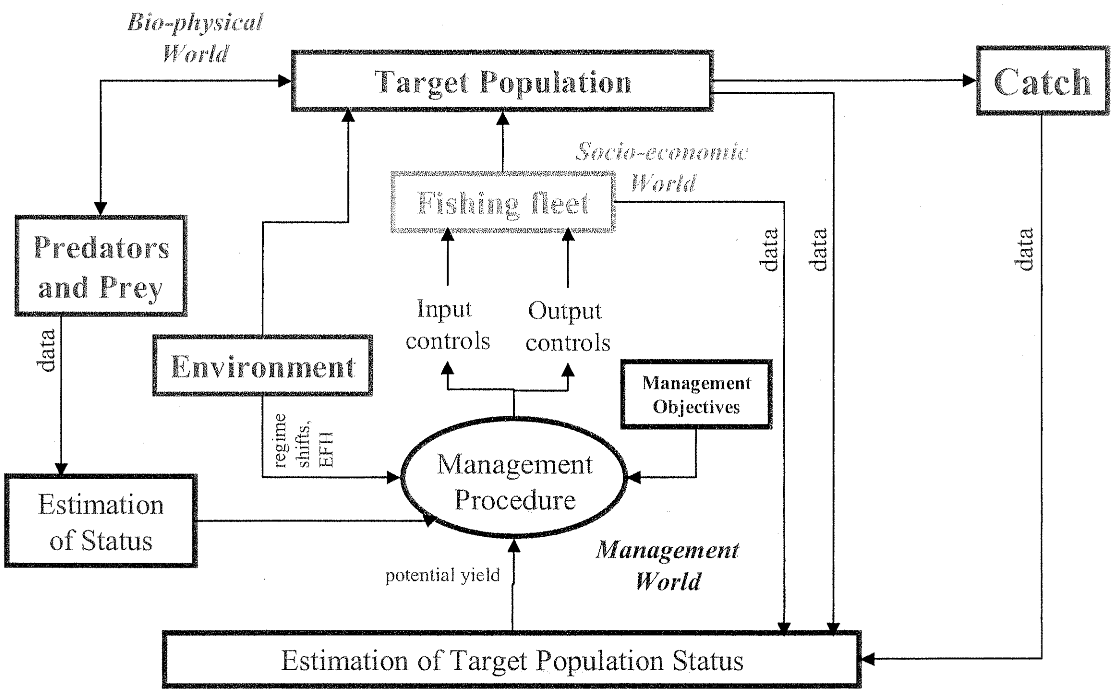


Figure 4.3. In the first stage of management that takes ecological and ecosystem considerations into account in an explicit manner, both the status of the target stock and its predators and prey are considered, but these are not integrated in a holistic management play. In some sense, then status of prey and predators thus constrain the catch limit from the management procedure.

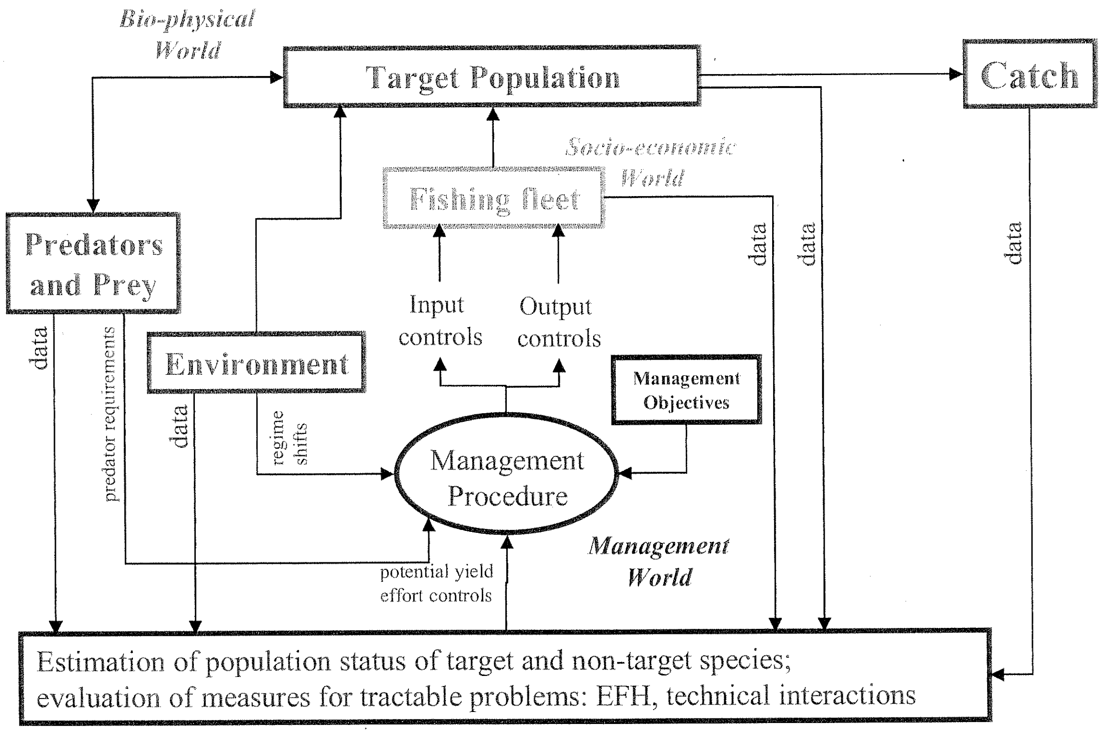


Figure 4.4. In the second stage of explicit consideration of ecological and ecosystem effects, one takes into account environmental effects in a more direct fashion in consideration of the status of the target stock and incorporates measures for the tractable problems described in Section 4.2.2.1.

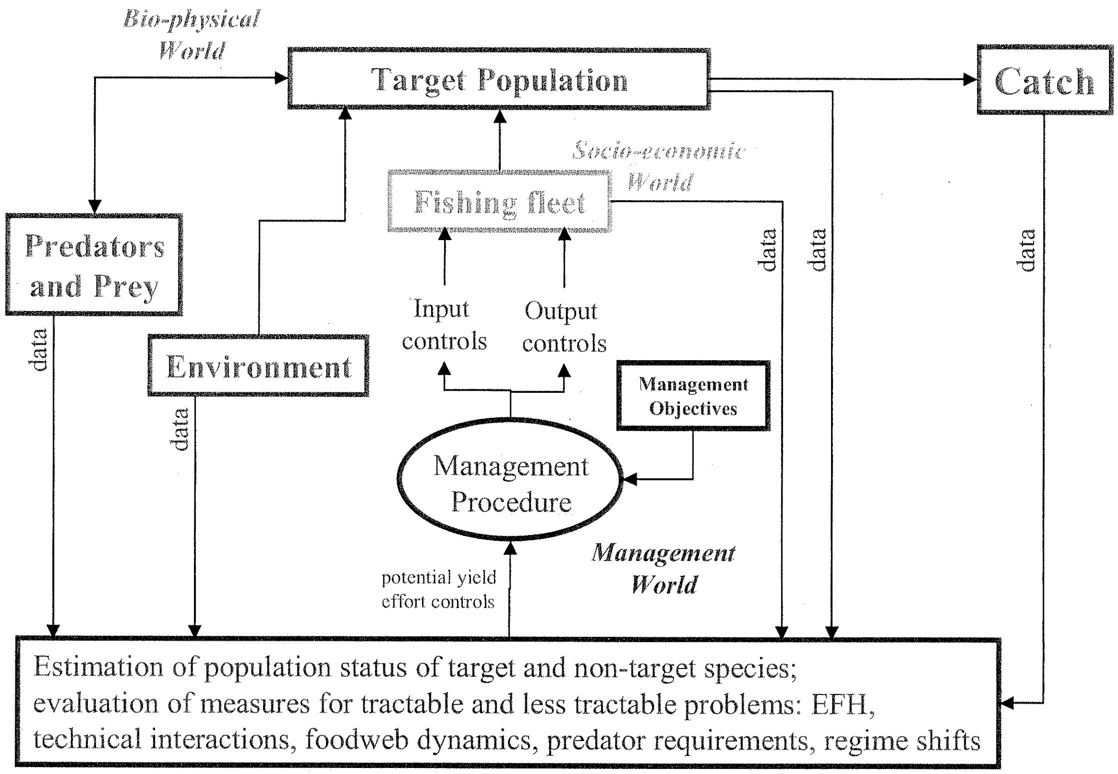


Figure 4.5. In the third stage, the environment, target stock, and its predators and prey are integrated in the assessment before the management procedure is used to determine catch limits. At the same time, the less tractable problems identified in Section 4.2.2.2 are included

Appendix 5

The following descriptions of the operations of the Science and Statistical Committees (SSCs) of the North Pacific and Pacific Fishery Management Councils (FMCs) was extracted from a larger document entitled "The Use of Scientific Review by the Regional Fishery Management Councils: The Existing Process and Recommendations for Improvement", which described the operations of the other FMCs in the country as well. It was prepared by David Witherell, deputy director of the North Pacific Fishery Management Council for the March 2005, Managing Our Nation's Fisheries II Conference held in Washington, D.C.

North Pacific Fishery Management Council

The North Pacific Council's SSC currently has 15 members, consisting of population dynamics biologists, ecologists, economists, and social scientists from academia and federal and state agencies, appointed on an annual basis. There are no SSC members from private businesses or other organizations.

While most members are drawn from the Pacific Northwest, the SSC includes members from California, Utah, and Rhode Island. In practice, the SSC is a self-appointing body that recruits new members as they see fit, although in practice there are members who serve in "agency" seats for Oregon, Washington, Alaska, and NOAA Fisheries. Although the Council has final approval authority regarding SSC membership, recommendations of the SSC regarding its membership have always been approved by the Council. Each year, SSC members elect a chair and vice-chair from among their membership. While most chairs serve for several years, few serve for more than 3-4 years. The current SSC includes two former chairs, who serve with the current chair as an informal chairman's council regarding the structure and operation of the SSC.

The SSC meets for 2 to 3 days, 5 times per year (or more frequently if the Council schedules additional public meetings). The SSC chair or vice-chair remain available to the Council for 2-3 days following the completion of the SSC meeting, to be able to present the minutes to the Council as each agenda item is reviewed by the Council and to respond to questions that Council members may have about the meaning and intent of those minutes. The SSC meetings occur at the same locale and begin just prior to each Council meeting to facilitate public participation and input. In addition, the SSC holds occasional workshops with agency analysts and researchers to explore analytic innovations or to encourage the development of new research programs.

The SSC reviews the scientific information for most actions that come before the Council[12]. The process for changing regulations begins with a proposal that may originate from the fishing

[12] Before each meeting, the Executive Director (or Deputy Director) and the SSC chair discuss Council agenda items and identify those items that are most likely to require scientific review. The SSC generally does not review housekeeping items or items that are in final review. If however, the SSC requested that draft analytic documents be released after revision, the SSC is often asked to review the final draft document for compliance with SSC requests. The SSC may also be asked to review final review documents if there have been substantive changes in the documents or information included in the documents.

industry, environmental groups, NOAA Fisheries, the Council, or other advisory groups including the SSC itself.

The proposal is evaluated in subsequent meetings through discussion papers, environmental assessments, and socio-economic analyses. At each stage, the SSC provides scientific input to improve the analysis, and also makes a recommendation as to whether the analytical document is ready for public review, meaning that it meets their standard of best scientific information available.

The process for SSC review is similar in most instances. First, the SSC receives the first draft of an environmental assessment or impact statement, regulatory impact review, or other analytical document, by mail about 1-4 weeks prior to a meeting. At the SSC meeting, the lead analytical staff for a particular agenda item presents a summary of the analysis, and answers questions from SSC members. The public is given an opportunity to testify, and frequently several fishery participants or environmental representatives may testify on the scientific and technical details of a given analysis. Following the staff reports and public testimony, SSC members deliberate the scientific content of a given analysis. Generally, the SSC focuses their deliberations to determine best available scientific information by examining the appropriateness of input data, the methodology applied, and the conclusions drawn from the analysis. To ease the workload for individual SSC members, the SSC chair generally assigns 2-3 members to be discussion leaders for each agenda item topic. These individuals also summarize the SSC discussion and deliberation, and then prepare the first draft minutes for that particular analysis or issue.

All SSC members have an opportunity to review the draft minutes before they are presented to the Council by the SSC chair. The turn around time for preparing written minutes is short; in some cases the issue may have been discussed by the SSC less than one day prior to reporting to the Council. SSC members, particularly the chair and vice-chair, often work long hours to complete their minutes for distribution at the Council meeting. The minutes of the NPFMC SSC are not a formal record of deliberation, but represent a consensus opinion regarding the scientific merit of the documents under consideration. These minutes are not adopted by formal vote. The minutes also provide recommendations to improve the scientific analysis to meet SSC approval.

Should analysis be deficient and major revisions be required, the SSC will recommend to the Council that it not be released for public review. With the exception of a few very technical scientific issues (e.g., establishing overfishing definitions and setting acceptable biological catch limits), the SSC does not generally provide the Council with an explicit recommendation on which alternative should be chosen, but rather provides guidance on relative strength of the scientific information available (i.e., uncertainty). For example, in February 2005, the SSC reviewed the revised analysis and evaluation of fishing effects on essential fish habitat, and commented that "The analysis found no evidence that Council-managed fishing activities have more than minimal and temporary effects on essential fish habitat for any FMP species. Yet, a significant proportion of the ratings for fishing effects were classified as unknown. Given this result, application of the precautionary approach is warranted." Citing the SSCs recommendation in their deliberations, the Council voted unanimously to prohibit bottom trawling over vast areas, and establish 'marine reserves' in the areas shown to have dense deep water coral aggregations.

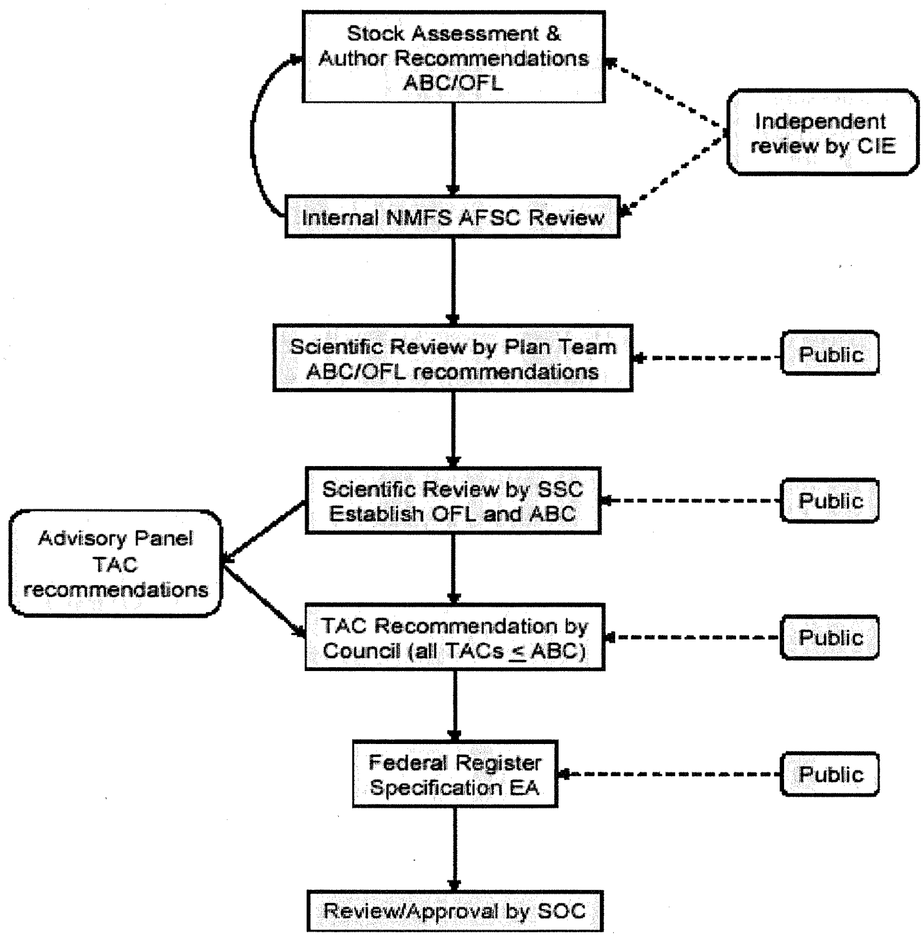
There are several levels of scientific review for stock assessments of North Pacific groundfish stocks (Figure 1). Nearly all of the stock assessments are conducted by highly competent and respected NOAA Fisheries scientists from the Alaska Fisheries Science Center. These assessments are subject to internal review process at the Science Center. As a further quality control measure, one or two assessments are sent each year to the Center for Independent Experts for further peer review. Following these review processes, the stock assessments are further vetted by the Council's Plan Teams established for each FMP. The plan teams consist of state and federal scientists and managers that meet twice annually to review the assessments, prepare stock assessment and fishery evaluation reports, and, for groundfish stocks, recommend acceptable biological catch limits. The SSC makes a final review of the stock assessments and acceptable biological catch limits (ABCs). The Council has had a long standing practice of adopting all of the SSC's ABC recommendations, and this process was formally incorporated into the groundfish FMPs by amendments 83/75.

On occasion, an independent review by scientists outside of the SSC has been requested to get additional insights into scientific information on particularly controversial scientific issues. Recent examples of independent review include an evaluation of the harvest rate strategies used for North Pacific groundfish (Goodman et al. 2002), reviews on potential competition of fisheries with Steller sea lions (Bowen et al., 2001, NRC 2003), and a review of the evaluation of fishing activities that affect essential fish habitat (Drinkwater et al. 2004). These reviews came at a cost of time and money (approximately $110,000 for the harvest rate review, $140,000 for the Steller sea lion Biological Opinion review, $500,000 for the NRC review of Steller sea lions and fisheries, and $130,000 for the review of fishing effects on benthic habitat). Although none of the conclusions of these peer reviews were contrary to earlier findings by the SSC on these same issues, they did provide other perspectives regarding scientific content and analytical procedures.

From this standpoint, the reviews were beneficial in that they provided additional scientific guidance for analysts and the Council, and increased confidence that the best scientific information was made available.

<u>Council use of SSC recommendations</u> (from Table 1 of full report): The Council follows the SSC advice wherever possible or feasible. Council always follows SSC catch limit recommendations (always a single number for each stock or complex)

Figure 1. Flow chart depicting the scientific review process for stock assessments and establishment of catch specifications in the North Pacific region. Catch specifications include the overfishing level (OFL), the acceptable biological catch level (ABC), and total allowable catch limits (TAC), where TAC≤ABC≤OFL.



Pacific Fishery Management Council

The Pacific Council has a single SSC, with a 16 member composition set by a representation formula established in the Council's operational procedures. There are four state representatives (ID, WA, OR, CA), five federal representatives (2 Southwest Fishery Science Center, 2 Northwest Fishery Science Center, 1 Alaska Fishery Science Center), and 1 representative from the Treaty Indian Tribes. These members have indefinite terms and are nominated by their home agencies. In addition, there are six "at large" members that serve 3-year terms. Current composition of the "at-large" seats is: 2 Southwest Fishery Science Center, Fisheries Research Biologists, 1 University of Washington faculty, 1 University of California, Santa Cruz faculty, 1 California State Monterey faculty, and 1 private sector (an economist not associated with an agency or academia). The SSC operating procedures further requires that the committee consist of three social scientists, of which at least two shall have economic expertise. Currently, there are 3 economists; other expertise includes fishery biology, population dynamics, biostatistics. In addition to the standing SSC, there are six SSC subcommittees, one for each or the four FMPs (salmon, groundfish, highly migratory species, coastal pelagic species), one for MPAs, and one for economics.

Nominations for at-large seats are sought through an open nomination process. Vacancies are announced and candidates are solicited via the Pacific Council's website and via mailings to the public, agencies, and universities. The nomination period opens at least one month (and often longer) before consideration at a Council meeting and nominations are due along with Council meeting briefing materials, approximately two weeks before the meeting. Anyone can nominate an individual and individuals can self-nominate. Nominations must include a cover letter and CV. The SSC reviews nominations and evaluates qualifications of candidates in closed session and presents review results to the Council. The SSC review results are provided during Council closed session before the Council makes the appointments. The SSC chair and vice-chair serve two-year terms. Officers are elected by the SSC and approved by the Council chairman.

The SSC meets at each of the five Council meetings in a year, usually for the first two days of the meeting, but sometimes longer. The subcommittees meet as needed at the direction of the Council chair or the Executive Director. In recent years, the SSC subcommittees have met frequently, on the order of a half-dozen meetings in addition to the five Council meetings. Meetings of the SSC and SSC subcommittees are open to the public, and public comment is taken during SSC agenda topics (at the discretion of the SSC chair). There is also a public comment period for items not on the SSC agenda on the Monday of each SSC meeting. The SSC produces written reports at the Council meeting, and the SSC chair (or other SSC member) provides an oral report of their findings and responds to Council questions. Public testimony on SSC recommendations to the Council are taken after each SSC statement. SSC minutes are made available in the subsequent Council meeting briefing materials and are available on the Pacific Council's website.

The Pacific Council's SSC provides scientific review of all science and technical matters that are a component of Council decision making including harvest levels, fishery and economic models used by Technical Teams, population prediction models, harvest guidelines, Terms of Reference for stock assessment processes, and technical portions of Fishery Management Plan amendments and National Environmental Protection Act documents. Examples of special projects by category include: the SSC's marine reserves subcommittee has completed a white paper, *Marine Reserves:*

Objectives, Rationale, Fishery Management Implications, and Regulatory Requirements, the groundfish subcommittee is working on terms of reference for reviewing rebuilding plans, the groundfish subcommittee and economics subcommittee jointly reviewed Groundfish Essential Fish Habitat analyses, completed an economic capacity report for the *Groundfish Strategic Plan,* and reviewed commercial fishery bycatch modeling methods, and the highly migratory species subcommittee reviewed methods for assessing sea turtle impacts in the high seas longline fishery. Additionally, each year, the salmon subcommittee reviews salmon fishery modeling, run size prediction, and harvest policy methodologies.

For specific recommendations, like harvest levels, if a single value is provided by the SSC the Council generally adopts the recommended harvest level. The SSC may provided a range of possible harvest levels derived from the stock assessment process to advise to the Council on inherent uncertainties and risk. The SSC reports to the Council the range of values, the uncertainty, and level of risk (e.g., risk prone, risk-neutral, risk-averse).

Outside review of scientific and technical matters for the Pacific Council occurs during the Council sponsored stock assessment review process (which has been used for coastal pelagic species and groundfish) included participation by Center for Independent Expert reviewers from outside the Pacific Council family. The SSC then reviews the results of the stock assessment process and reports to the Council. SSC statements to the Council are not subject to outside review.

In addition to the SSC, each FMP has both a technical (or management) team. Technical teams are composed of fishery managers, biologists, and statisticians from the federal, tribal, and state agencies. Technical teams monitor catch rates, recommend harvest levels, and analyze the impacts of various management measures. Models and methods used by Technical Teams are reviewed by the SSC.

<u>Council use of SSC recommendations</u> (from Table 1 of the full report): The Council follows the SSC advice wherever possible or feasible. Council always follows SSC catch limit recommendations for single catch limit value, and within SSCs ranges of values for ABC and OY (Council generally selects midpoint).

STATUS REPORT OF THE 2005 OCEAN SALMON FISHERIES OFF WASHINGTON, OREGON, and CALIFORNIA.

Preliminary Data Through August 31, 2005.

Fishery and Area	Season Dates	Effort Days Fished	CHINOOK Catch	CHINOOK Quota	CHINOOK Percent	COHO[a] Catch	COHO[a] Quota	COHO[a] Percent
				COMMERCIAL				
Treaty Indian[b]	*5/1-6/23*	243	25,232	25,000	101%		Non-Retention	
	7/1-8/31	276	12,876	22,768	57%	19,705	50,000	39%
Non-Indian North of Cape Falcon[c]	*5/1-6/30*	881	27,545	29,000	95%		Non-Retention	
	7/7-8/25	1,003	17,277	15,705	110%	4,030	23,200	17%
Cape Falcon - Florence S. Jetty	*3/15-6/30*	4,298	78,044	NA	NA		Non-Retention	
	9/1-10/31	NA	NA	NA	NA		Non-Retention	
Florence S. Jetty - Humbug Mt.	*3/15-5/30*	2,795	59,346	NA	NA		Non-Retention	
	9/1-10/31	NA	NA	NA	NA		Non-Retention	
Humbug Mtn - OR/CA Border	*3/15-4/15*	7	93	NA	NA		Non-Retention	
	9/3-9/30	NA	NA	3,000	NA		Non-Retention	
OR/CA Border - Humboldt S. Jetty	*9/3-9/30*	NA	NA	6,000	NA		Non-Retention	
Horse Mt. - Pt. Arena	*9/1-9/30*	NA	NA	NA	NA		Non-Retention	
Pt. Arena - Pigeon Pt.	*7/4-8/29*	5,500	161,000	NA	NA		Non-Retention	
	9/1-9/30	NA	NA	NA	NA		Non-Retention	
Pt. Reyes - Pt. San Pedro	*10/3-10/14*	NA	NA	NA	NA		Non-Retention	
Pigeon Pt. - Pt. Sur	*5/1-5/30*	3,000	67,200	NA	NA		Non-Retention	
	7/4-8/29	1,900	31,000	NA	NA		Non-Retention	
	9/1-9/30	NA	NA	NA	NA		Non-Retention	
Pt. Sur - U.S./Mexico Border	*5/1-8/31*	600	16,600	NA	NA		Non-Retention	
	9/1-9/30	NA	NA	NA	NA		Non-Retention	
				RECREATIONAL				
U.S./Canada Border - Cape Alava[c]	*7/1-8/31*	14,529	2,484	4,300	58%	9,460	12,667	75%
Cape Alava-Queets River[c]	*7/1-8/31*	3,935	1,329	1,900	70%	1,680	3,067	55%
	9/24-10/9	NA	NA	100	NA	NA	100	NA
Queets River - Leadbetter Pt.[c]	*6/26-8/31*	29,146	17,811	28,750	62%	8,132	45,066	18%
Leadbetter Pt.-Cape Falcon[c]	*7/3-8/31*	35,452	11,301	8,200	138%	32,613	60,900	54%
Cape Falcon - Humbug Mt.	*3/15-6/17*	3,032	667	None	NA		Non-Retention	
	8/1-8/31	9,797	6,738	None	NA		Non-Retention	
	9/1-10/31	NA	NA	None	NA		Non-Retention	
Cape Falcon - OR/CA border	*6/18-7/31*	28,514	10,187	None	NA	3,582	40,000	9%
Humbug Mt. - Horse Mt. (KMZ)	*5/21 - 7/4*[d]	9,433	10,878	None	NA		Non-Retention	
	8/14-8/31	8,823	4,998	None	NA		Non-Retention	
	9/1-9/11	NA	NA	None	NA		Non-Retention	
Horse Mt. - Pt. Arena (Ft. Bragg)	*2/12-8/31*[e]	22,300	20,900	None	NA		Non-Retention	
	9/1-11/13	NA	NA	None	NA		Non-Retention	
Pt. Arena - Pigeon Pt. (San Francisco)	*4/2-8/31*	63,900	57,000	None	NA		Non-Retention	
	9/1-11/13	NA	NA	None	NA		Non-Retention	
Pigeon Pt. - U.S./Mexico Border	*4/2-8/31*	43,400	30,500	None	NA		Non-Retention	
	9/1-9/25	NA	NA	None	NA		Non-Retention	

TOTALS TO DATE	Effort 2005	Effort 2004	Effort 2003	Chinook Catch 2005	Chinook Catch 2004	Chinook Catch 2003	Coho Catch 2005	Coho Catch 2004	Coho Catch 2003
TROLL									
Treaty Indian	**519**	637	292	**38,108**	44,154	33,556	**19,705**	52,607	8,635
Washington Non-Indian		1,244	1,602	**34,416**	33,470	54,925	**1,242**	7,191	7,963
Oregon	**7,658**	10,615	8,920	**147,889**	216,333	237,498	**2,788**	2,114	5,130
California	**11,000**	19,129	13,263	**275,800**	478,087	414,071	**0**	0	0
Total Troll	**19,177**	31,625	24,077	**496,213**	772,044	740,050	**23,735**	61,912	21,728
RECREATIONAL									
Washington	**72,714**	96,845	110,662	**29,491**	21,384	31,594	**42,211**	97,033	125,707
Oregon	**55,637**	123,691	126,554	**22,201**	48,176	33,109	**13,252**	69,375	111,981
California	**144,000**	197,788	123,479	**122,800**	206,035	89,178	**784**	1,366	604
Total Recreational	**272,351**	418,324	360,695	**174,492**	275,595	153,881	**56,247**	167,774	238,292
PFMC Total	**N/A**	N/A	N/A	**670,705**	1,047,639	893,931	**79,982**	229,686	260,020

a/ All non-Indian coho fisheries are mark-selective

b/ Treaty Indian effort is reported as landings.

c/ Numbers shown as chinook quotas for non-Indian troll and recreational fisheries North of Falcon are guidelines rather than quotas; only the total chinook allowable catch is a quota.

d/ Catch and effort from Oregon during the mark selective coho fishery 6/18-7/4 is included above, only California catch and effort is included for that period in this row.

e/ Closed July 11-15 and 18-22

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES

Mar. 4	National Marine Fisheries Service (NMFS) provides the Council with a letter outlining the 2005 management guidance for stocks listed under the Endangered Species Act (ESA).
Mar. 8	Council recommends inseason adjustment for commercial fisheries between Cape Falcon and Humbug Mt., Oregon to close April 16-30; fish caught in the area prior to April 16 must be landed in the state of Oregon; and fish caught between Humbug Mt. and the Oregon/California border prior to May 1 must be landed in the ports of Gold Beach, Port Orford, or Brookings. New regulations to take effect May 1, 2005.
March 10	Council recommends inseason adjustment for commercial fisheries between Cape Falcon and the Oregon/California border to be open March 15 through March 25 and April 1 through April 15, then remaining closed through the rest of April, with the same landing restrictions as above. New regulations to take effect May 1, 2005.
Mar. 11	Council adopts four commercial and recreational ocean salmon fishery management options for public review.
Mar. 16	North of Cape Falcon Salmon Forum meets in Olympia, Washington to initiate consideration of recommendations for treaty Indian and non-Indian salmon management options.
Mar. 28-29	Council holds public hearings on proposed 2005 management options in Westport, Washington, Coos Bay, Oregon, and Fort Bragg, California.
Mar. 29	North of Cape Falcon Salmon Forum meets in Lynnwood, Washington to further consider recommendations for treaty Indian and non-Indian salmon management options.
Apr. 7	Council adopts final ocean salmon fishery management recommendations for approval and implementation by the U.S. Secretary of Commerce. The proposed measures comply with the salmon fishery management plan (FMP) and the current biological opinions for listed species. An emergency rule is not required for implementation.
May 4	Ocean salmon seasons implemented as recommended by the Council and published in the *Federal Register* on May 4 (70 FR 23054).
May 21	NMFS inseason conference number three results in extending the May 20-23, 2005 opening of the U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery for an additional three days, through May 26, 2005 with a 125 chinook per vessel landing limit for the seven-day open period. The fishery was to remain closed until further action.
May 31	NMFS inseason conference number four results in reopening of the U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery effective midnight, June 3 through June 6, 2005 with a 60 chinook per vessel landing limit for the four-day open period.
June 8	NMFS inseason conference number five results in reopening of the U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery effective midnight, June 26 through June 30, 2005 with a 30 chinook per vessel landing limit for the five-day open period.
July 25	NMFS inseason conference number six results in changing the Cape Alava to Cape Falcon recreational fishery bag limit to allow retention of two chinook and open seven days per week beginning July 29.
Aug. 11	NMFS inseason conference number seven results in changing the U.S./Canada border to Cape Alava recreational fishery bag limit to allow retention of two chinook beginning August 16.
Aug. 23	NMFS inseason conference number eight results in closure of the U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon fishery effective midnight, August 23 as the 15,705 chinook quota (14,250 preseason plus 1,455 roll-over from the May-June fishery) was reached.

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES (continued)

Aug. 25 NMFS inseason conference number nine results in changing the U.S./Canada border to Cape Alava recreational fishery to seven days per week beginning August 30.

Sep. 7 NMFS inseason conference number ten results in changing the Leadbetter Point to Cape Falcon recreational fishery bag limit to two fish, all salmon except chinook, all coho must have a healed adipose fin clip, beginning September 9.

Sep. 7 NMFS inseason conference number eleven results in changing the Leadbetter Point to Cape Falcon recreational fishery bag limit to two fish, all salmon, with no chinook bag restriction, and all coho must have a healed adipose fin clip, beginning September 17.

NON-INDIAN COMMERCIAL TROLL SEASONS

Mar. 15-25 Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens April 1-15; May 1-3, 8-10, 15-17, 22-24, and 29-30; June 1-30; September 1-23; and October 1-31. All fish caught in the area must be landed in the state of Oregon.

Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens April 1-15; May 1-30; September 1-23; and October 1-31. All fish caught in the area must be landed in the state of Oregon.

Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens April 1-15; and September 3 through the earlier of September 30 or a 3,000 chinook quota. All fish caught in the area must be landed in the ports of Gold Beach, Port Orford, or Brookings, Oregon.

Apr. 1-15 Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery reopens. The fishery reopens May 1-3, 8-10, 15-17, 22-24, and 29-30; June 1-30; September 1-23; and October 1-31. All fish caught in the area must be landed in the state of Oregon.

Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery reopens. The fishery reopens May 1-30; September 1-23; and October 1-31. All fish caught in the area must be landed in the state of Oregon.

Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery reopens. The fishery reopens September 3 through the earlier of September 30 or a 3,000 chinook quota. All fish caught in the area must be landed in the ports of Gold Beach, Port Orford, or Brookings, Oregon.

May 1 Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery opens through May 30. The fishery reopens September 1-23 and October 1-31.

Pigeon Point to Point Sur, non-Indian commercial all-salmon-except-coho fishery opens through May 31. The fishery reopens July 4-August 29, and September 1-30.

Point Sur to U.S./Mexico border, non-Indian commercial all-salmon-except-coho fishery opens through September 30.

May 1-3 U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 75 chinook per vessel landing limit for the three-day open period and a 29,000 chinook quota. The fishery is scheduled to reopen May 6 with any remaining quota.

Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens May 8-10, 15-17, 22-24, and 29-30; June 1-30; September 1-23; and October 1-31.

May 6-9	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 100 chinook per vessel landing limit for the four-day open period and the remainder of the 29,000 chinook quota. The fishery is scheduled to reopen May 13 with any remaining quota.

NON-INDIAN COMMERCIAL TROLL SEASONS (continued)

May 8-10	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens May 15-17, 22-24, and 29-30; June 1-30; September 1-23; and October 1-31.
May 13-16	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 125 chinook per vessel landing limit for the four-day open period and the remainder of the 29,000 chinook quota. The fishery is scheduled to reopen May 20 with any remaining quota.
May 15-17	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens May 22-24 and 29-30; June 1-30; September 1-23; and October 1-31.
May 20-26	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 125 chinook per vessel landing limit for the seven-day open period and the remainder of the 29,000 chinook quota. The fishery is scheduled to reopen June 3 with any remaining quota.
May 22-24	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens May 29-30; June 1-30; September 1-23; and October 1-31.
May 29-30	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens. The fishery reopens June 1-30; September 1-23; and October 1-31.
May 30	Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery closes. The fishery reopens September 1-23 and October 1-31.
May 31	Pigeon Point to Point Sur, non-Indian commercial all-salmon-except-coho fishery closes. The fishery reopens July 4-August 29, and September 1-30.
June 1	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens through June 30. The fishery reopens September 1-23 and October 1-31.
June 3-6	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 60 chinook per vessel landing limit for the four-day open period and the remainder of the 29,000 chinook quota. The fishery is scheduled to reopen June 26 with any remaining quota.
June 26-30	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 30 chinook per vessel landing limit for the five-day open period and the remainder of the 29,000 chinook quota.
June 30	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery closes as scheduled.
	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery closes. The fishery reopens September 1-23 and October 1-31.
July 4	Point Arena to Point Sur, non-Indian commercial all-salmon-except-coho fishery opens through August 29. The fishery reopens September 1-30
July 7-11	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon fishery opens with a 75 chinook per vessel landing limit for the five-day open period on a quota of 15,705 chinook quota (14,250 preseason plus 1,455 rollover from the May-June fishery) and 23,200 marked (adipose fin clipped) coho. The fishery is scheduled to reopen July 14 with any remaining quota.

July 14-18	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon fishery opens with a 75 chinook per vessel landing limit for the five-day open period on the remainder of the 15,705 chinook quota and the 23,200 marked coho quota. The fishery is scheduled to reopen July 21 with any remaining quota.

NON-INDIAN COMMERCIAL TROLL SEASONS (continued)

July 21-25	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon fishery opens with a 100 chinook per vessel landing limit for the five-day open period on the remainder of the 15,705 chinook quota and the 23,200 marked coho quota. The fishery is scheduled to reopen July 28 with any remaining quota.
July 28-Aug. 1	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon fishery opens with a 100 chinook per vessel landing limit for the five-day open period on the remainder of the 15,705 chinook quota and the 23,200 marked coho quota. The fishery is scheduled to reopen August 3 with any remaining quota.
Aug. 3-7	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon (except no chum north of Cape Alava) fishery opens with a 100 chinook per vessel landing limit for the five-day open period on the remainder of the 15,705 chinook quota and the 23,200 marked coho quota. The fishery is scheduled to reopen August 10 with any remaining quota.
Aug. 10-14	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon (except no chum north of Cape Alava) fishery opens with a 100 chinook per vessel landing limit for the five-day open period on the remainder of the 15,705 chinook quota and the 23,200 marked coho quota. The fishery is scheduled to reopen August 17 with any remaining quota.
Aug. 17-22	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon (except no chum north of Cape Alava) fishery opens with a 100 chinook per vessel landing limit for the five-day open period on the remainder of the 15,705 chinook quota and the 23,200 marked coho quota. The fishery closes for the remainder of the season as the 15,705 chinook quota is reached.
Aug. 29	Point Arena to Point Sur, non-Indian commercial all-salmon-except-coho fishery closes. The fishery reopens September 1-30
Sep. 1	Cape Falcon to Humbug Mt. non-Indian commercial all-salmon-except-coho fishery opens through September 23. The fishery reopens October 1-31.
	Horse Mt. to Point Arena, non-Indian commercial all-salmon-except-coho fishery opens through September 30.
	Point Arena to Point Sur, non-Indian commercial all-salmon-except-coho fishery opens through September 30.
Sep. 3	Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery reopens through the earlier of September 30 or a 3,000 chinook quota.
	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery opens through the earlier of September 30 or a quota of 6,000 chinook.
Sep. 23	Cape Falcon to Humbug Mt. non-Indian commercial all-salmon-except-coho fishery closes. The fishery reopens October 1-31.
Sep. 30	Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery is scheduled to close.
	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery is scheduled to close.
	Horse Mt. to Point Arena, non-Indian commercial all-salmon-except-coho fishery closes.
	Point Arena to Point Sur, non-Indian commercial all-salmon-except-coho fishery closes.
	Point Sur to U.S. Mexico border, non-Indian commercial all-salmon-except-coho fishery closes.

Oct. 1 — Cape Falcon to Humbug Mt. non-Indian commercial all-salmon-except-coho fishery opens through October 31.

NON-INDIAN COMMERCIAL TROLL SEASONS (continued)

Oct. 3-14 — Point Reyes to Point San Pedro, non-Indian commercial all-salmon-except-coho fishery opens Monday to Friday.

Oct. 31 — Cape Falcon to Humbug Mt. non-Indian commercial all-salmon-except-coho fishery closes.

TREATY INDIAN COMMERCIAL TROLL SEASONS

May 1 — All-salmon-except-coho fisheries open through the earlier of June 30 or a 25,000 chinook quota (any remainder of the quota is not transferable, but overages to be deducted from the July 1 through September 15 quota).

June 23 — All-salmon-except-coho fisheries close as the 25,000 quota was reached.

July 1 — All-salmon fisheries open through the earlier of September 15, a 22,768 chinook quota (23,000 preseason minus 232 overage from the May-June fishery), or a 50,000 non-mark-selective coho quota.

Sep. 15 — Scheduled closure of the all-salmon commercial fisheries.

RECREATIONAL SEASONS

Feb. 12 — Horse Mt. to Point Arena, all-salmon-except-coho fishery opens through July 10. The fishery reopens July 16-17 and July 23-November 13.

Mar. 15 — Cape Falcon to Humbug Mt., all-salmon-except-coho fishery opens through October 31. The fishery (along with the area between Humbug Mt. and the Oregon/California border) allows mark-selective (adipose fin clipped) coho retention beginning June 18 through the earlier of July 31 (July 4 south of Humbug Mt.) or a 40,000 coho quota, then reverts back to all-salmon-except-coho for the remainder of the season.

RECREATIONAL SEASONS, (continued)

Apr. 2 — Point Arena to Pigeon Point, all-salmon-except-coho fishery opens through November 13.

Pigeon Point to the U.S./Mexico border, all-salmon-except-coho fishery opens through September 25.

May 21 — Humbug Mt. to Horse Mt., all-salmon-except-coho fishery opens through July 4. The fishery reopens August 14 through September 11. The fishery in the area north of the Oregon/California border (including the area between Humbug Mt. and Cape Falcon) allows retention of marked coho beginning June 18 through the earlier of July 4 or a 40,000 marked coho quota, then reverts back to all-salmon-except-coho beginning August 14 for the remainder of the season.

June 18 — Cape Falcon to Oregon/California border, all-salmon mark-selective coho fishery opens through the earlier of July 31 north of Humbug Mt. or July 4 south of Humbug Mt., or a quota of 40,000 marked coho. The fishery reopens for all-salmon-except-coho the earlier of the attainment of the coho quota or August 1 for the area north of Humbug Mt. and August 14 for the area south of Humbug Mt., and continues through October 31 for the area north of Humbug Mt., and through September 11 for the areas south of Humbug Mt.

June 26 — Queets River to Leadbetter Point, all-salmon mark-selective coho fishery opens though the earlier of September 18 or a 45,066 marked coho quota, with a 28,750 chinook guideline. Fishery is open Sunday to Thursday with a daily-bag-limit of two fish, only one of which can be a chinook through July 28. Beginning July 29 the fishery is open seven days per week with a two fish bag limit and no chinook bag restriction. All coho must have a healed adipose fin clip.

RECREATIONAL SEASONS, (continued)

July 1	U.S./Canada border to Cape Alava, all-salmon mark-selective coho fishery runs through the earlier of September 18 or a 12,667 coho quota, with a 4,300 chinook guideline. Fishery is open Tuesday to Saturday through August 29. Beginning August 30 the fishery is open seven days per week. The daily-bag-limit of is two fish, only one of which can be a chinook through August 15. Beginning August 16 the daily bag limit is two fish with no chinook bag restriction. All coho must have a healed adipose fin clip. No chum retention in August and September.
	Cape Alava to Queets River, all-salmon mark-selective coho fishery opens though the earlier of September 18 or a 3,067 marked coho quota, with a 1,900 chinook guideline. Fishery is open Tuesday to Saturday with a daily-bag-limit of two fish, only one of which can be a chinook through July 28. Beginning July 29 the fishery is open seven days per week with a two fish bag limit and no chinook bag restriction. All coho must have a healed adipose fin clip. No chum retention in August and September.
	Leadbetter Point to Cape Falcon, all-salmon mark-selective coho fishery opens though the earlier of September 30 or a 60,900 marked coho quota, with a 8,200 chinook guideline. Fishery is open Sunday to Thursday with a daily-bag-limit of two fish, only one of which can be a chinook through July 28. Beginning July 29 the fishery is open seven days per week with a two fish bag limit and no chinook bag restriction. September 9-16, bag limit is all salmon except chinook, two fish per day. All coho must have a healed adipose fin clip. Closed between Tillamook Head and Cape Falcon beginning August 1.
July 4	Humbug Mt. to Horse Mt., fishery, including mark selective coho fishery, closes as scheduled.
July 10	Horse Mt. to Point Arena, all-salmon-except-coho fishery closes. The fishery reopens July 16-17 and July 23-November 13.
July 16-17	Horse Mt. to Point Arena, all-salmon-except-coho fishery opens. The fishery reopens July 23-November 13.
July 23	Horse Mt. to Point Arena, all-salmon-except-coho fishery reopens through November 13.
July. 31	Cape Falcon to Humbug Mt., all-salmon mark-selective coho fishery closes as scheduled.
Aug. 1	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery reopens through October 31.
Aug. 14	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery opens through September 11.
Sep. 11	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery closes.
Sep. 18	Scheduled closure of the U.S./Canada border to Cape Alava, all-salmon mark-selective coho fishery.
	Scheduled closure of the Cape Alava to Queets River, all-salmon mark-selective coho fishery.
	Scheduled closure of the Queets River to Leadbetter Point, all-salmon non-mark-selective fishery.
Sep. 24	La Push area (47E58'00" to 47E50'00"), all-salmon mark-selective coho fishery is scheduled to open through the earlier of October 9, a 100 chinook quota, or a 100 coho quota.
Sep. 25	Pigeon Point to U.S./Mexico border, all-salmon-except-coho fishery closes.
Sep. 30	Scheduled closure of the Leadbetter Point to Cape Falcon, all-salmon mark-selective coho fishery.
Oct. 9	Scheduled closure of the La Push area, all-salmon mark-selective coho fishery.
Oct. 31	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery closes.

TABLE IR-10. Sequence of events in ocean salmon fishery management through September 13, 2005.[a/] (Page 8 of 7)

RECREATIONAL SEASONS, (continued)

Nov. 13	Horse Mt. to Point Arena, all-salmon-except-coho fishery closes.
	Point Arena to Pigeon Point, all-salmon-except-coho fishery closes.

a/ Unless stated otherwise, season openings or modifications of restrictions are effective at 0001 hours of the listed date. Closures are effective at midnight.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910
THE DIRECTOR

AUG 26 2005

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, Oregon 97220-1384

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Dear Mr. ~~Hansen~~ Don:

I am happy to present to you our Draft Operational Guidelines for Development and Implementation of Fishery Management Actions (OGs) and request your assistance in implementing them on a test basis.

This draft was prepared in close conjunction with the Sustainable Fisheries Assistant Regional Administrators, and with input from the Office of Protected Resources, Office of Habitat Conservation, Office of the General Counsel for Fisheries, Office of Law Enforcement, and the regional National Environmental Policy Act (NEPA) Coordinators. My staff also reviewed the approach with regional and Fishery Management Council (Council) staff in regional workshops during 2004, and with the Council Chairs at the April 2004 meeting in Hawaii. In March 2005, we circulated a revised draft for additional internal review through the Policy Directives System review process. Based on these reviews, this draft has been modified to address concerns associated with practicability, resource constraints, and perceived effects on Council autonomy. It has also been modified to include greater detail regarding the Endangered Species Act section 7 consultation process.

Overview of Guidelines:

The philosophy and principles of the draft OGs include cooperation and shared responsibility with Councils, frontloading review, and use of the Magnuson-Stevens Fishery Conservation and Management Act and NEPA processes as a framework for necessary analyses. The draft describes the roles and responsibilities of various offices, and establishes an approach for increasing collaboration through joint planning efforts and Regional Operating Agreements (ROAs). Standards are identified to assess the adequacy of fishery management actions and a model is described for ensuring effective communication and reconciliation of statutory timelines.

The model represents a quality-based, outcome-oriented approach based on the Hazard Analysis Critical Control Point (HACCP) system that will facilitate achievement of our Regulatory

Streamlining Performance goals. It identifies steps in the regulatory process where critical errors may occur that would prevent an action from meeting the standards and requires feedback at those key steps, leaving room for discretion and flexibility in terms of working out particular staffing questions and approaches for complying with stated standards. The narrative defines new terminology used in the model, provides an overview of the key steps in the process, and describes the four key phases of rulemaking. A fundamental feature of the model is the requirement at four steps for an affirmative statement from the Regional Administrator that documentation and process are adequate and complete to proceed with the action. Barring the issuance of such a statement, actions being developed pursuant to the model should not move forward until deficiencies are corrected.

Table 1 is the heart of the model. It sets forth 16 steps and 3 substeps that potentially apply to any fishery management action, and for each step specifies who needs to be involved, what standards apply, what timing factors must be considered, and what, if any, documentation is necessary, along with additional commentary where applicable. Depending on the type of action being prepared (Fishery Management Plan vs. regulatory amendment), the type of NEPA analysis necessary, and the potential for effects on protected species or essential fish habitat, the number of steps that would be applicable could be less than 16. Steps that apply in only limited circumstances are identified. If the approach in the model is followed, the result should be an expedited review and implementation process at the end, with better litigation results and improved decision-making.

Next Steps:

Successful implementation of these guidelines will require continuing collaboration between the Councils and NOAA's National Marine Fisheries Service (NMFS). A key first step is to develop written ROAs that specify agency and Council responsibilities and steps that will be taken to prepare documentation for fisheries conservation and management decisions. I request that you immediately initiate implementation of these draft OGs on a test basis by developing an ROA with your corresponding NMFS regional office.

I also request that you begin utilizing the joint planning process to identify and prioritize upcoming needs and actions and raise issues with national policy implications to NMFS Headquarters for early guidance. I also recommend that, to the extent practicable and on a test basis, you begin applying the model contained in the Draft OGs to new actions being developed. Please be aware that NOAA General Counsel has expressed concern that full implementation of the model may not be possible under current resource constraints.

As we begin to move forward with ROA development and OG implementation, please identify any problem areas that you perceive with the current approach. I want to emphasize that the

Draft OGs are intended to function as a living document that can be modified to address changing needs. We should plan to discuss implementation progress and needs for modifications at the next meeting with Council Chairs.

Sincerely,

Bill

William T. Hogarth, Ph.D.
Assistant Administrator
for Fisheries

Enclosure

DRAFT OPERATIONAL GUIDELINES:

For Development and Implementation of Fishery Management Actions

August 23, 2005

DRAFT OPERATIONAL GUIDELINES: For Development and Implementation of Fishery Management Actions

Table of Contents

I. Introduction

A. Statement of the Assistant Administrator

In April 2001, I convened an Executive Session of NOAA Leadership to announce NMFS commitment to a new way of doing business. Recognizing a need to improve the decision-making process for fishery management actions, we set an ambitious goal for ourselves: to develop a model process for better integrating the multiple statutory mandates applicable to fisheries management, improving decision-making, and reducing litigation risks. As our project progressed, the regional fishery management councils, Congress, and others helped refine our objectives by focusing on the following specific needs: clearer definition of missions, authorities, roles, and responsibilities; assuring adequacy of decision documents; reconciling statutory timelines; elimination of unnecessary delays and unpredictable outcomes; increasing accountability; and utilization of standardized practices.

Our commitment to achieving these goals has required a sustained effort by agency leadership and staff at all levels. We have also benefited from support and cooperation from friends and resources outside the agency. As a result of this cooperative effort, I am pleased to introduce draft revised Operational Guidelines that will help us meet our stated needs.

These Operational Guidelines include a model for integrating our statutory mandates. They approach the fishery management decision-making process from a quality-based, outcome oriented perspective. They rely heavily on the concepts of cooperation and shared responsibility with councils; frontloading of review; and use of the MSA and NEPA processes as a framework for pulling together all necessary analyses. I want to emphasize that NMFS leadership is committed to ensuring frontloading by all key reviewers and early identification of issues. We are also committed to processing documents through the agency decision-making systems on an expedited basis when they have been prepared in conformance with the model. If this approach is followed, the result should be an expedited review and implementation process at the end, with better results in litigation and improved decision-making all around. I also want to stress that these guidelines are intended to function as a living document that can be updated and modified as needs arise.

Coordination with the fishery management councils is a central feature of these guidelines. Recognizing that the councils are uniquely situated to inform the development of sound fishery management measures, these guidelines take special account of the role of the councils in the process and institutionalize a spirit of collaboration. I look forward to a future of enhanced cooperation with the councils in terms of both developing fishery management measures and continually assessing the effectiveness of our process.

Many thanks to everyone who gave time and energy to help NMFS develop this approach to better fulfilling our mission as stewards of our nation's marine resources.

B. Structure of the Operational Guidelines

Parts I and II of these OGs provide background on and an overview of the philosophy of the guidelines. Parts III and IV define the roles of the various parties involved in the development and implementation of fishery management actions, and identify applicable standards. Part V provides a model for the fishery management process that is quality-based and outcome-oriented, and that identifies checks for assuring adequacy of process and analyses at critical junctures. The model is intended to serve as a tool rather than a mandate. Adherence to the model is not mandatory for the Councils.

C. Purpose and Objectives

These OGs provide an approach for establishing a formalized cooperative relationship with the Councils and set forth a model for integrating the many statutory mandates that apply to the development of fishery management actions. Consistent with our efforts under the Regulatory Streamlining Project (RSP), the approach taken in the OGs addresses problems with "unnecessary delays, unpredictable outcomes, and lack of accountability" and moves us towards the application of "standardized practices" to "improve the quality and efficiency of regulatory decisions and raise the likelihood of success in litigation" (S. RPT 107-42).

These guidelines are based on the concept of "frontloading," which refers to active participation of Council and key agency staff (e.g., Sustainable Fisheries, Protected Resources, Habitat Conservation, Economists, Social Scientists, and General Counsel) at the early stages of fishery management action development – a "no surprises" approach. The goal is to ensure that, to the extent practicable, all significant legal and policy issues will be identified early in the process.

The objective of these OGs is to facilitate development and implementation of fishery management actions under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).[1] A related goal is to facilitate development of more concise documentation. While these guidelines have been tailored to fit the MSA fishery management process for Council-developed actions, the underlying principles have broad applicability, and National Marine Fisheries Service (NMFS) will apply them to other agency actions as appropriate.

The preparation, review, approval and implementation of fishery management actions and the attendant rules and regulations under the MSA is, by its very nature, a complex process in which the Councils and the Secretary have distinct, yet overlapping roles. In many instances, the issues presented are controversial, politically charged, and difficult to analyze. In addition, a variety of other applicable laws impose even more analytical and procedural requirements on an already complex system. NMFS, with direction from Congress, initiated the RSP to improve the way the agency and the Councils integrate the multiple mandates governing fisheries management; increase efficiency in designing and implementing fishery management measures; and improve overall the decision-making process. The ultimate intent of streamlining is to ensure that the process is done correctly the first time. This implies:

- Legal and policy requirements will be identified and considered earlier in the process so that they may be dealt with more expeditiously ("frontloading"). The frontloading process may require more investment of time upfront, but should help ensure that potential problems are identified early and are not allowed to become real problems in later stages of review and implementation.

[1] The term "fishery management actions" should be interpreted broadly to include a wide range of activities taken pursuant to the MSA, including proposed and final rulemakings, Fishery Management Plans with no implementing regulations, and other substantive actions by the agency that promulgate or are expected to lead to the promulgation of a final rule or regulation, including notices of inquiry, and advance notices of proposed rulemaking.

- The OGs will provide clear and consistent articulation of critical requirements while allowing Regional Staff flexibility to work with their Councils to achieve overall objectives for frontloading and the development of quality documentation of their decision making process.

- Quality control and assurance activities will ensure that requirements are being met, and that, if problems arise, they do not recur.

- Timely inputs and review by staff will occur as early as possible in the process.

- The ability of the Councils and NOAA to develop actions and policy will be enhanced when we work together to follow the standards and requirements set forth in the OGs.[2]

- NMFS Headquarters offices (HQ) will be involved early in substantive discussions that have implications for consistency with national policies and guidance, develop new guidance as needed and make it available via the web, facilitate the processing of decision documents, and conduct training and quality assurance.

These guidelines identify requirements and standards, while allowing maximum flexibility for the Councils and NMFS Regional Staffs to design implementation procedures that are most effective in their particular contexts. These guidelines focus on the fishery management plan (FMP)/regulation process and completely supercede the OGs prepared in 1997.

D. Philosophy and Approach

1. Fishery management decisions must be supported by documentation that adequately provides for the basis of a decision under the existing legal requirements.

2. The respective decisions of the Councils and NMFS are sufficiently interrelated that they ought to be supported by the same record. Thus, the guidelines focus on collaborative efforts by Council and NMFS staff to develop the documentation that supports their decisions.

3. Consistent with the objective of emphasizing the roles of Councils and NMFS Regional Staff, the approach is to raise, analyze and properly deal with all issues as soon as they can be anticipated. The model contained within these guidelines identifies points in the process where agency feedback is critical (Critical Feedback Points (CFPs)), and the basic documents that are required at each CFP to assure quality. The model then sets forth a system for obtaining agency feedback that the process and documents support and provide a rational basis for decision-making and are legally sufficient at that stage for the process to move forward. Details regarding how each Council and NMFS Regional Office address their particular implementation of procedures to achieve this sufficiency will be left to them to develop collaboratively through Regional Operating Agreements (ROAs). The use of feedback mechanisms at CFPs in the model is not intended to prevent the use of more frequent, or continuous, feedback loops.

> *A CFP is a step in the decision-making process at which critical decisions are made that could ultimately affect approvability of the action. The number of CFPs applicable to an action varies depending on the NEPA and MSA requirements that apply to that action. The OGs identify a full list of steps and CFPs for each type of action in the model.*

[2] NMFS Regional Staffs include both the Science Center staff and the Regional Office staff. Although Regional GC is technically part of NOAA GC rather than NMFS staff, whenever possible, Regional GC will participate as part of the Regional Staff team.

4. All relevant NOAA and DOC reviewers will participate early in the process to ensure that their concerns are raised at a point in the process where they can be addressed in such a way that progress is not delayed or halted later. In short, the intent is to avoid sequential reviews and encourage concurrent input to decisions at the earliest stage possible.

5. Councils and NMFS Regional Staffs will each undertake a joint planning process that occurs at least once annually and provides for a 12- to 24-month planning horizon. This process should provide a forum for identifying and prioritizing upcoming needs and actions. Any issues with national policy implications will be raised to NMFS HQ for early guidance.

6. Councils and NMFS Regional Offices will enter into written ROAs that specify responsibilities and steps that will be taken to prepare documentation for fisheries conservation and management decisions.

> *Each region will enter into written Regional Operating Agreements with its Council/s delineating specific roles, responsibilities, and timing issues necessary to conform with these OGs.*

II. General Principles for the Fishery Management Process

A. Use of the MSA and NEPA Processes as an Umbrella. The open and public processes required by the MSA and the National Environmental Policy Act (NEPA) will provide the basis for implementing regulatory streamlining. Together, the MSA and NEPA require the incorporation of all relevant factors into fisheries conservation and management decisions, prescribe an open process for identifying issues and considering a range of alternatives, provide for review and participation by affected States and Indian tribes, and promote effective public review and input. The MSA requires fishery management actions to be consistent with other applicable laws. Similarly, Council on Environmental Quality (CEQ) Regulations for Implementation of NEPA require agencies to integrate the NEPA process with other planning and regulatory compliance requirements (such as the consultation requirement under Section 7 of the Endangered Species Act (ESA), and consistency determinations under the Coastal Zone Management Act (CZMA)). This integration must occur at the earliest possible time to ensure that planning and decisions take into account environmental values reflected in these other laws and regulations, avoid delays later in the process, and prevent potential conflicts with alternatives and mitigation methods required by other laws. Documents prepared under the MSA and NEPA do not replace other applicable requirements, such as the Regulatory Impact Review (RIR), which is prepared in compliance with EO 12866, or the Preliminary Regulatory Economic Evaluation (PREE) prepared in compliance with the Regulatory Flexibility Act (RFA). Rather, the public processes of the MSA and NEPA provide a venue for addressing all applicable requirements.

B. Frontloading. All relevant reviewing parties will participate early in the process to ensure that all significant legal and policy issues are identified to the extent practicable. Draft documents will be circulated to all Regional, Science Center, GC, and Council staff in key responsibilities, as well as Headquarters Staff (HQS) as appropriate, for review and comment. When the model is followed, drafts will be circulated prior to CFPs.

> *The term HQS refers to Headquarters staff who will be expected to review and/ or clear an action. Specifically, HQS include the NOAA Office of Strategic Planning (OSP); the Office of the General Counsel (GC); the NMFS Assistant Administrator for Fisheries (AA); the Offices of Sustainable Fisheries (OSF), Habitat Conservation (OHC), and Protected Resources (OPR); the Office of Law Enforcement (OLE); and the Department of Commerce Office of General Counsel (DOC OGC), as applicable.*

C. **Collaboration in the Preparation of Documents.** Beginning at the earliest planning stage, it is essential that the staffs of the Councils and the NMFS Regional Offices collaborate in the preparation and drafting of documents. It should not be assumed that either the Councils or the Regional Offices have a particular responsibility for doing all of the staff work for any given required document. How this happens in each Council/Region pairing will be established by an operating agreement between the Council and the Regional Office.

D. **Regional Operating Agreements with Councils.** Individual needs and variations among regions should be accommodated while ensuring adequacy of process and documentation nationwide. There is a need for a clear understanding of roles, responsibilities, and obligations among all parties who have a role in ultimately clearing an action. Therefore, each Region will develop ROAs with its individual Councils, via the Council Executive Directors and in consultation with the appropriate Regional Attorney, that set forth the procedures and review/clearance processes it will use to ensure the preparation of adequate and complete documents.

E. **Coordination with NMFS Headquarters.** The Regions shall ensure that NMFS HQ offices have the opportunity to consider and provide input to decisions from the earliest stages. NMFS HQ will track decisions as they progress and will be expected early in the process to advise the Regional Offices of national policy concerns. In addition they will facilitate the consideration of decisions in process by other HQ reviewers (NOAA and DOC). A formal Communication Protocol will be established to facilitate such coordination.

> *Communication Protocol: NMFS HQ will work with the regions to establish a protocol to ensure good communication between the regions and HQ on all actions. The protocol will specify how and when the AA should be advised of issues relating to actions, as well as prioritizations of actions made pursuant to the joint*

F. **Council Action/NMFS Advisory Statements.** When the model is followed, at CFPs the Regional Administrator will provide written feedback that the process and documentation are adequate and complete. These procedures are described in greater detail in section V, below.

G. **Determinations Must be Logically Supported by the Facts and Analyses in the Record.** Determinations regarding an action's legal and programmatic sufficiency must be supported by the underlying analyses. This applies to both substantive conclusions and determinations regarding procedural sufficiency.

> *Advisory Statements are letters to a Council from the RA indicating that the relevant documentation and process are adequate and complete for that step and that all necessary reviewers have been consulted. The Advisory Statement requires a determination of legal sufficiency by the Regional GC before its transmission to the Council.*

H. **Clear and Concise Documentation.** Documents to support decisions must be clearly written and easily understandable by the public. Clear and concise writing will facilitate development of a clear and complete record and will ensure the development of enforceable regulations.

I. **Expedited Approval and Implementation Process, Benefits of Conformance.** Adherence to agency guidance on standards for analytical documents will expedite the approval and implementation process. Documentation that does not adhere to agency guidance (e.g., requires additional analysis or consideration of additional issues) may not be processed in an expedited manner. To the extent that Councils and NMFS staff follow the model set forth below, Council-recommended fishery management actions will benefit from more timely review, approval, and implementation; higher likelihood of approval; and decreased risk of litigation. In some circumstances, adherence to the model may enable

NMFS to approve an FMP or amendment earlier than day 95 of the Secretarial review process (i.e, between days 61 and days 95). In addition, adherence to the model will ensure greater accountability of NMFS and GC staff charged with reviewing Council documents and providing timely advice.

J. Concurrent Reviews. These reviews are encouraged throughout the process of developing documentation. Sequential reviews delay the decisions from moving forward in a timely manner.

III. Roles

This section describes the general roles of various parties involved in preparation and implementation of fishery management actions. Additional details regarding specific responsibilities for analysis, drafting, and review, including provisions for assuring appropriate coordination between HQ and regional offices and ensuring consistent interpretation and application of national policies, should be specified in the ROAs and Communication Protocol.

A. Roles in General

- **The Councils** are responsible under the MSA for the preparation of FMPs. The Councils initiate documentation to support fishery conservation and management decisions, and collaborate with the NMFS Regional Offices, and state agencies and other stakeholders as appropriate.

- **The NMFS Regional Staffs** are responsible for working as part of a team with Council staff to develop adequate and complete documentation, coordinating comments from HQ and Regional Staff such that the agency presents a unified message pursuant to procedures set forth in the ROA and Communication Protocol, advising NMFS HQ of decisions being made, and forwarding documentation to HQ. When the model is followed, the Regional Administrator (RA) will provide Advisory Statements confirming the adequacy and completeness of process and documentation as provided in these guidelines, or elevate to HQ and seek to resolve any issue preventing the issuance of an Advisory Statement, including any issue preventing a determination of legal sufficiency.

- **The NMFS Science Centers,** in addition to working as part of the NMFS Regional Staffs described above, and working as part of the team cooperating with the Councils, in some instances, the Science Centers make certifications regarding certain requirements, including overfishing definitions. The specific responsibilities of each Science Center are specified in the Region's ROAs.

- **At NMFS Headquarters**, the AA is responsible for (1) deciding whether to concur in the RA's decision regarding approval of Council-recommended FMPs/amendments; (2) deciding whether to approve final rules; (3) determining that the appropriate environmental impact review, EIS, or FONSI has been completed for the action; and (4) resolving with NOAA/GC HQ any issues elevated to HQ including issues preventing issuance of an Advisory Statement and issues related to a determination of legal sufficiency. Within HQ, the Office of Sustainable Fisheries (OSF) will track Regional Council and NMFS FMP activities; consult with and advise regions on the national policy implications of decisions; package and forward regional documents to the NMFS leadership; and facilitate communications to resolve problem issues raised during HQ or NOAA/DOC/OMB reviews, either as a participant on an FMAT or as otherwise appropriate.

- **NOAA GC** will advise the Councils and NMFS Regional Offices, through the NOAA GC Regional Offices, throughout the process of developing documentation and making and reviewing decisions. GC Regional Offices will provide legal advice to the RA confirming legal sufficiency of documentation and process, and elevate to NOAA/GC HQ any issue preventing a determination of legal sufficiency. NOAA GC will also provide legal advice, through GCF, to NMFS leadership as appropriate, and will provide final approval for legal sufficiency of regulatory packages requiring clearance from NOAA HQ or DOC/GC. NOAA GC HQ will also work with NMFS HQ to resolve legal issues elevated from the Regions.

- **NOAA's NEPA Coordinator**, in the Office of Strategic Planning, Program Planning and Integration (PPI/OSP), reviews and provides final clearance for all EISs and FONSIs. Additionally, the NOAA NEPA Coordinator is responsible for filing EISs with the Environmental Protection Agency and signing all transmittal letters that disseminate NEPA documents for public review.[3]

B. Specific Duties and Responsibilities

1. **Regional Operating Agreements (ROAs).** Each Region will enter into written agreements with its Council/s, in consultation with the appropriate Regional Attorney, delineating specific roles and responsibilities necessary to conform with these OGs. The provisions of the ROAs must be sufficient to ensure compliance with the applicable requirements. The ROAs should also specify the roles of the Science Centers and may address interactions with Regional GC. If an existing Operations Plan explains the role of the Science Center, the ROA may simply reference the existing plan. The ROA should also address timing issues associated with the need to provide draft documents with sufficient lead time to allow for quality review and comment.

2. **Communication Protocol.** NMFS HQ will work with the regions to establish a protocol to ensure good communication on all actions. The protocol will specify how and when the AA should be advised of issues relating to actions, as well as prioritizations of actions made pursuant to the joint planning process. The protocol will also establish steps that HQ will take to facilitate movement of actions through HQ review. Each HQ office that has responsibility for ensuring national consistency on fishery management activities is encouraged to develop protocols with its regional counterparts to set forth procedures for ensuring early involvement, providing opportunities for review, and communicating about how issues have been resolved. In addition, NMFS may wish to develop a Communication Protocol for communicating on issues and decisions with States, interstate commissions, and Indian Tribes that share management responsibility for affected resources.

IV. Standards

A. Standards for Assessing Adequacy of Content

NMFS currently relies on the following guidance documents that provide standards of adequacy for relevant applicable laws:

- FRA, APA: Document Drafting Handbook, OFR; Preparation of FR Documents, 2004.
- CZMA: NOS regulations at 15 CFR part 930.
- DQA: May 5, 2003, NMFS Section 515 Pre-dissemination Review Guidelines; NOAA's Information Quality Guidelines, October 1, 2002.
- ESA: ESA Consultation Handbook; ESA CFR regulations (50 CFR 402.01 et seq.).

[3] Note that the NOAA NEPA Coordinator is a separate position from the NMFS NEPA Coordinator whose job is to assist at the Fisheries level with NEPA compliance.

- MSA: National Standards Guidelines 50 CFR 600 et seq.; Essential Fish Habitat (EFH) Final Rule (67 FR 2343, Jan. 17, 2002); EFH Consultation Guidance; Social Science Guidelines.
- NEPA: CEQ Regulations; NAO 216-6; EPA Guidance, "Reviewing Environmental Impact Statements for Fishery Management Plans," Nov. 2004.[4]
- RFA, EO 12866: Guidelines for Economic Analysis of Fishery Management Actions (65 FR 65841, Nov. 2, 2000); GCF Guidance on EO 12866 compliance (Macpherson memo, 2/06/98).
- PRA: 5 CFR 1320 et seq.

B. Standardized Format, Templates, and Examples

OSF will develop and maintain a website that contains a comprehensive set of templates and examples of documents.

V. Model for Achieving RSP Goals

This model combines outcome-oriented guidance on requirements at various stages in the decision-making process with quality control checkpoints to ensure timely feedback on whether standards are being met. As a first step, the model identifies the relevant steps in the process, then identifies those steps at which critical decisions must be made that could ultimately affect the approvability of a fishery management action, i.e., CFPs. The full range of steps is set forth in Table 1, below. The model requires feedback at certain CFPs to ensure that frontloading is occurring and that documentation and process are adequate and complete to support decision making at the following steps: Step 2, the initial determination of which NEPA document to prepare; Steps 4, and 4(c) if relevant, Council identification of preferred alternative and adoption of a Draft Environmental Impact Statement (DEIS); Step 7, Council vote to recommend agency action; and Step 9, the step at which the RA prepares a Decision Memorandum to begin Secretarial review.

The model uses new terminology to describe the quality-based approach. The terminology and procedures of the model are explained below and in Table 1.

A. Terminology and Concepts.

1. **Critical Feedback Points (CFPs).** A CFP is a step in the decision-making process at which critical decisions are made that could ultimately affect approvability of the action. The number of CFPs applicable to an action varies depending on the MSA and NEPA requirements that apply to that action. For an FMP with an EIS, there are 16 steps, and potentially three additional substeps if ESA or EFH consultations are necessary, four to five of which are CFPs. In contrast, other actions, such as a regulatory amendment for which a Categorical Exclusion (CE) is asserted, may have only ten steps, of which three are CFPs. The full list of steps and CFPs for each type of action are delineated in Table 1.

[4] In addition to the published regulations, CEQ has developed a variety of guidance documents to assist drafters in preparing environmental analyses. Guidance on issues such as conducting scoping, assessing cumulative impacts, and addressing environmental justice requirements, among other topics, are available via the CEQ website at http://ceq.eh.doe.gov/nepa/nepanet.htm. Information regarding EPA's review process is available at EPA's website, http://www.epa.gov/compliance/resources/policies/nepa/nepa_policies_procedures.pdf.

2. **Feedback Mechanisms.** In this model, feedback mechanisms are used at steps 2, 4, 4(c) (if applicable), 7, and 9, to ensure that the necessary procedural steps have been completed and the documentation and analyses are sufficient to allow the process to proceed. These checks take the form of written documentation from the RA and are described in greater detail below.

   a. **Steps 2, 4, 4(c), and 7, Advisory Statements.** At steps 2, 4, 4(c), and 7, the RA provides written feedback known as an "Advisory Statement," in the form of a letter to the Council indicating the relevant documentation and process are adequate and complete for that step and that all necessary reviewers have been consulted. The Advisory Statement is accompanied by a written determination of legal sufficiency. As described below in paragraphs 4 and 5, assessments of adequacy and legal sufficiency will be based on applicable standards and will vary according to the point in the process at which the action is being evaluated. It is likely that requisite degrees of review will also vary according to the CFP. The ROAs and the Communication Protocol will specify procedures for ensuring that all necessary parties participate and provide feedback. Timing is a factor here – in order for the RA to sign an Advisory Statement, he/she must have draft documents available for review to circulate to all relevant reviewers sufficiently in advance of planned Council action.

   The Advisory Statement is a new type of feedback mechanism created in these guidelines. It serves several important functions in RSP: (1) it ensures that concerns are raised at the points in the process where they can be addressed and corrected; (2) it makes agency reviewers accountable for raising issues early in the process; (3) it helps prevent unexpected outcomes and/or delays at the end of the process; and (4) it ensures that decisions reflect regional and national policy, thereby achieving consistency.

   b. **Step 9, RA's Decision Memorandum.** The RA's Decision Memorandum to initiate Secretarial review will serve to certify that the analyses as presented by the Council support the final decision and were reasonably considered by the Council in accordance with the procedures and requirements in the OGs. The Decision Memorandum is accompanied by a Certification of Attorney Review from the Regional GC. If the documentation does not fully reflect the action the Council took, that concern should be conveyed to the Council. The Decision Memorandum to initiate Secretarial review is not a new document. However, this model identifies it as an appropriate tool for ensuring feedback is provided at the relevant CFP.

3. **Action Plan.** Under this model, a preliminary planning and vetting document called an "Action Plan" is prepared prior to the commencement of drafting the initial NEPA document (EA, CE, or Notice of Intent (NOI) to prepare an EIS) at step 2. The Action Plan describes the problem to be addressed and the objective to be met, indicates what type of NEPA analysis will initially be undertaken, includes an estimated timeline to implementation taking into account the possible need to reconcile differences and all relevant timing requirements (e.g., APA, ESA), describes a reasonable range of alternatives, provides an estimate of staff resource requirements (if practicable), identifies the core staff who will work on development of the action (the "fishery management action team, i.e., FMAT, defined below), and includes a checklist of other applicable laws indicating which are likely to raise issues that will need to be addressed, and, if possible, an initial plan for ensuring they are addressed. The other applicable laws that are most likely to be relevant include the following: MSA, ESA, MMPA, RFA, APA, EOs 12866 and 13272 (Economic Impacts), EO 13132 (Federalism), PRA, CZMA, and the DQA. Some fishery management actions may also be subject to additional laws, such as Indian Treaty Rights. The specific laws applicable to a particular fishery management action can only be identified on a case-by-case basis.

The Action Plan is a preliminary document intended to help guide the drafting of initial documentation for the planned action. It is not intended to constrain the development or revision of alternatives and/or analysis. It is likely that the range of alternatives may change as the process progresses and public participation occurs. The acceptability of such changes will be evaluated at subsequent CFPs. Councils may choose to participate and vote on the development of all or part of the Action Plan, or they may delegate the responsibility to their staff in the interest of time.

4. **"Adequate and Complete."** The term "adequate and complete" refers to compliance with applicable standards as they relate to a particular point in the process. It includes both procedural and substantive requirements. Because different requirements will apply to different types of actions, and different requirements apply at different phases of the process, adequacy and completeness must be assessed on a case-by-case basis. A determination of "adequacy and completeness" includes a finding of "legally sufficiency" by Regional GC.

5. **"Legally Sufficient."** An action is legally sufficient if: (1) there is a credible basis to conclude that the action is within the agency's authority and consistent with any constraints imposed by statute or regulations; (2) there is a credible basis to conclude that the agency has complied with all applicable procedural requirements; and (3) the agency has articulated a rational explanation for the action in the administrative record.

6. **Other Applicable Law.** Various laws, administrative orders, and other directives must be addressed in context of fishery management action development, approval, and implementation. The relevant other applicable laws, some of which provide for specific consultative roles for States and Indian Tribes, may include the MSA, ESA, MMPA, RFA, APA, EOs12866 and 13272 (Economic Impacts), EO 13132 (Federalism), PRA, CZMA, Indian Treaty Rights, and the DQA. At each CFP, all relevant applicable law should be considered, and issues relevant to the particular CFP identified, considered, and addressed.

7. **Fishery Management Action Team (FMAT).** The FMAT is an interdisciplinary group that consists of core agency and Council staff, and others as necessary, who work on a particular action from the beginning. To the extent practicable, members of the team should be specified in the Action Plan for each action. The team should include representatives of each part of the agency that has a significant issue to address and that will be involved in review and implementation of the ultimate action, and should include or coordinate with HQS, described in greater detail below, as appropriate. The Action Plan will set forth the list of participants on the FMAT. Additional HQS will participate as specified in the Communication Protocol described below.

8. **Headquarters Staff (HQS):** The term HQS refers to Headquarters staff who will be expected to review and/or clear an action. Specifically, HQS includes the NOAA Office of Strategic Planning (OSP) and Office of the General Counsel (GC); the NMFS Assistant Administrator for Fisheries (AA) and Offices of Sustainable Fisheries (OSF), Habitat Conservation (HC), and Protected Resources (OPR); the Office of Law Enforcement (OLE); and the Department of Commerce Office of General Counsel (DOC OGC), as applicable.

9. **Technical Assistance:** The term "technical assistance" refers to the various forms of activities and advice described on pages 3-6 of the ESA Consultation Handbook. It consists of interactions between the action agency and the consulting agency concerning listed species issues prior to a consultation. In some cases, technical assistance will result in all information necessary to initiate informal consultation. In other instances, the action agency may have to provide additional information to the consulting agency.

10. Consultation Assessment: A "Consultation Assessment" is a new document that can be used during ESA section 7 consultations to facilitate coordination of ESA, MSA, and NEPA timelines and processes. The "Consultation Assessment" is a formal, written memorandum from the appropriate decision-maker in PR (either the RA or the PR ARA) to the SF ARA. It contains a summary of analyses and information developed during formal consultation, as well as preliminary conclusions that would form the basis for the Biological Opinion. It is not a substitute for a formal Biological Opinion.

Specifically, the Consultation Assessment would describe the action being analyzed and summarize the data gathered during the consultation, the analysis of that information, and discussions about the analyses that occurred among PR, SF, and the Councils (as appropriate). It would provide sufficient information to facilitate meaningful discussion about (i) the probable effects of a proposed fishery management action, or its alternatives, on listed species and designated critical habitat, and (ii) additional measures that could be taken to avoid potential risks to listed species and critical habitat. The Consultation Assessment would not include PR's determinations regarding "jeopardy" or "destruction or adverse modification of critical habitat." Those determinations would be provided in the subsequent Biological Opinion.

Under the model in these OGs, the Consultation Assessment would be completed at step 4(a) to document the results of the consultation on the preferred alternative. The information set forth in the Consultation Assessment would permit SF and the Council to make informed decisions about a proposed action or alternative prior to completion of a formal Biological Opinion

B. The Phases of FMP/Rulemaking Under the Model

This model identifies four basic phases to the development and implementation of any fishery management action. Whether an action is a rule or an FMP, and whether it will be supported by an EA, an EIS, or a CE, it is developed through the following four phases: (1) Phase I, Planning and Scoping; (2) Phase II, Preparation; (3) Phase III, Council Final Action; and (4) Phase IV, Secretarial Review and Implementation. For each of these phases the model identifies one or more sequentially numbered steps that are set forth in Table 1. This section provides a description of the procedures and steps in Table 1 and highlights actions required to conform to the model.

Phase I – Phase I is the planning and scoping phase. It contains up to two steps: the initiation of scoping, and a decision about which level of NEPA analysis to undertake initially. It is important to note that the term "scoping" has a legal meaning under NEPA, and that NEPA applies certain requirements to NEPA scoping. Because NEPA scoping is similar to MSA requirements for early public notice, these guidelines use the term "scoping" to refer to the broad range of activities that may take place in the initial stages of identifying a need for management and developing alternative solutions. As part of the scoping process, regulatory analysis and information collection requirements may be examined and preliminary estimates may be made of the costs and benefits of regulations. Concerns of affected States, including potential CZMP impacts, and Indian tribes are identified and public participation is encouraged. Consideration of potential impacts relating to the ESA, MMPA, EFH, and social impacts of the FMP also begins.[5] Informal scoping activities can take place as part of informal early planning in Step 1. However, if a decision is made to publish an NOI to prepare an environmental impact statement, even if the purpose of publishing the notice is to solicit input on the appropriateness of an EIS, certain legal requirements will be triggered. Once a

[5] We note that in some cases the ESA consulting agency will be the Fish and Wildlife Service (FWS) rather than NMFS OPR. In these cases, early cooperation with FWS is encouraged, but NMFS cannot commit to FWS's adherence to the approach in the model.

decision is made to draft an NOI or another type of NEPA document, the action will be considered to fall within Step 2, "Initial Determinations," and require an Action Plan.

During step 2, the Action Plan is completed prior to publication of an NOI, if applicable, or prior to drafting other NEPA documents. If an NOI has been used, the scoping summary report is prepared at the conclusion of the scoping period set forth in the NOI. The scoping summary report may modify some of the initial plans set forth in the Action Plan. Such modifications do not require formalized agency review at this point. Feedback at subsequent CFPs will address such changes.

Phase II – Phase II is the document development phase, and results in materials ready to support a final Council recommendation. It generally contains up to four steps, but might include up to seven steps if there is a need for EFH or ESA consultation. Step 3 consists of general frontloading activities and communications and results in the development of preliminary draft analytical documents to serve as a basis for selection of a preferred alternative and the Council's adoption of the draft analyses for public review at Step 4. Depending on individual Council preferences and variations in management needs, the range of activities that take place during Step 3 can vary widely, in some cases encompassing years of iterative drafting, public hearings, public comment, and multiple options papers and white papers; in other cases consisting of a single staff-level draft. During Step 3, the Councils have broad discretion and few constraints on their ability to explore alternatives and develop recommendations. In many instances, the bulk of Council activity may take place at Step 3. Step 3 is also critically important for the frontloading of ESA and EFH information. If no EIS is being prepared and no protected resources or EFH issues are present, the Council may chose to proceed directly from Step 3 to Step 7, the vote on recommended action. However, this model encourages the circulation of all such draft analyses for public comment while at the Council level.

Because applicable laws, including the MSA, NEPA, the ESA, and the APA, encourage the identification of a preferred alternative, limit our ability to select an alternative that has not been fully analyzed, and impose strict timelines on the decision making process, in this model, the preferred alternative is identified at Step 4 (i.e., prior to the publication of the DEIS), except in limited circumstances where the RA and GC agree that there appear to be no significant environmental or economic issues. In other words, once a preferred alternative is identified, the required processes of the MSA and other applicable law should move expeditiously forward through the MSA approval and implementation system and few, if any, additional modifications should be made to the preferred alternative. The work accomplished during steps 1-3 should facilitate expeditious review and implementation later in the process. If at Step 4 the preferred alternative would trigger the need for formal consultation under the ESA or an EFH consultation, then under the model, such consultations must take place on the preferred alternative, underlying analyses must be revised as necessary, and the Council may need to take another vote to select a preferred alternative based on the revised analyses. The consultation would conclude with production of a Consultation Assessment 90 days after initiation. The 45-day period for preparing the BO would not begin until SF requests PR to begin drafting. In cases where an EIS is being prepared, the 45-day preparation of the BO could run concurrently with the 45-day public comment period on the DEIS.

Once the draft NEPA analyses have been completed, they should be circulated for public review. When an EIS is being prepared, publication of the DEIS for public comment is mandatory under NEPA. Circulating the draft EA or CE for public comment is encouraged.

Phase III – During Phase III, the Council takes its final actions to select and recommend management measures to NMFS. There are two steps in this phase: (1) the Council's vote to adopt an FMP or regulatory amendment, followed by (2) staff work to prepare the recommendation for Secretarial review. Under this model, prior to the Council's vote, draft documents are reviewed by the RA, GC, and other necessary staff to determine whether they are complete and legally sufficient to support decision-making. The analytical work must be complete prior to the Council's vote; however, some additional tasks may remain to be completed after the vote. For instance, an ROA may provide for Council staff to prepare the CZMA letters, finalize regulatory text, or perform other tasks to finalize the Council's recommendation. The degree of complexity of a recommended measure could affect the amount of time necessary to finalize a package. For instance, if regulatory text has not been completed, or must be revised, after the Council's final vote, a significant amount of time could be necessary to complete this task. This type of timing issue should be factored, to the extent possible, into the Action Plan at Step 2. Note that parts of Phase III and Phase IV may occur simultaneously in that any remaining Council responsibilities necessary to prepare the recommendation package for formal submission may be completed at the same time that agency staff complete their own responsibilities necessary to prepare the Council's recommendation for formal submission.

Phase IV – During Phase IV, the Secretary reviews and approves, or disapproves, the Councils' recommendations. This phase encompasses the full range of agency activities necessary to package, review, and conduct proposed and final rulemaking on recommended fishery management measures. After the Council has completed its recommendation, agency staff complete their responsibilities necessary to prepare the Council's recommendation for formal submission. These activities occur as part of Step 9 and may occur simultaneously with Step 8, during which Council staff make final preparations for formal submission. As in Step 8, it is important to note that the degree of complexity of a recommended measure could affect the amount of time necessary to finalize a package for review. NMFS initiates formal public review of the Council's proposed measures by publishing in the *Federal Register* the Notice of Availability (NOA) of an FMP/FMP amendment and/or the proposed rule to implement the Council's recommendation. At this step, NMFS also files the FEIS with the Environmental Protection Agency (EPA). The MSA requires that, for FMPs and FMP amendments, NMFS must publish the NOA of the FMP immediately (within 5 days) for a 60-day comment period. Within 30 days of the close of the comment period, the agency must approve, partially approve, or disapprove the Council's recommendation. NMFS will send a letter to the appropriate Council notifying it of the official start date of the Secretarial review period. After reviewing public comment received on the NOA and/or proposed rule and on the Final Environmental Impact Statement (FEIS), the RA makes his/her decision regarding approval/ disapproval of the action to the AA, and the AA determines whether to concur. The final step for implementing the approved final rule is to send it to the Office of the Federal Register for publication.

C. Tables

Table 1: Model Process for Achieving Goals of RSP

Unless otherwise noted, the procedures set forth below are appropriate to apply to all Council-recommended MSA fishery management actions. Certain provisions may not apply to actions taken directly at the agency level. If a provision applies only to a certain type of action depending on its level of NEPA analysis or status as an FMP versus regulatory amendment, such distinction will be noted.

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
Phase I: Planning and Scoping						
1	Early Problem Identification and Planning (optional)[6]	All: • Council • RA/RO Staff • OSF Director signature on NOI	All: • Document Drafting Handbook, OFR • Preparation of *Federal Register* (FR) Documents • MSA public meeting requirements • CEQ Regulations • NAO 216-6 • ESA Consultation Handbook • EFH Consultation Guidance		All: • Notice of public meetings if any • ESA Technical Assistance, informal consultation or both[7]	Early input from affected States and Indian tribes should be solicited/encouraged. If ESA-listed species subject to FWS jurisdiction are present, early efforts should be made to coordinate with FWS and request their cooperation with our model, to the extent practicable. *If the decision is made to publish an NOI, even as an early planning document, proceed to step 2 before publishing. (The NOI is the first step in development of an EIS. Therefore, the NOI should be reviewed for adequacy and completeness, and appropriate parties assembled on the FMAT before publishing).

[6] The Early Planning step is an optional step that can precede the decision on what type of NEPA analysis to undertake. While the decision to engage in various types of pre-planning is optional, if these activities are undertaken, some of them involve legal requirements that must be met as set forth in this table.

[7] The term "technical assistance" refers to the various forms of activities and advice described on page 3-6 of the ESA Consultation Handbook.

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
2 **CFP**	Initial Determination	All: • FMAT (includes Council, GC, and Regional Staff as appropriate) • Consultation with HQS[8] • Council (may approve action plan) • RA (concurs in action plan) • OSF Director signature on NOI	All: • CEQ Regulations • NAO 216-6 • Document Drafting Handbook, OFR • Preparation of *Federal Register* (FR) Documents • ESA Consultation Handbook • EFH Consultation Guidance	All: • RA provides Advisory Statement on Action Plan prior to drafting NOI, DEIS, EA, RIR/PREE, social impact assessment. EIS: • 30-day minimum comment period on NOI	All: • Advisory Statement • Action Plan[9] • ESA Technical Assistance, informal consultation, or both EIS: • NOI • Scoping Meetings/ Notices (optional) • Scoping Summary Report (encouraged)	
Phase II: Preparation of the Action						
3	Frontloading/ Communication activities	• FMAT • HQS as appropriate	• CEQ Regulations • NAO 216-6 • ESA Consultation Handbook • EFH Consultation Guidance *Although no additional standards for documentation apply at this point, drafters should be cognizant of the standards that will apply at steps 4 and 7. See below.	*Note that for EA/CE actions, this may be the last step prior to the Council's vote at Step 7.	Preliminary analysis (DEIS, EA, CE) ESA Technical Assistance, informal consultation or both.	Note that there are no specific requirements associated with this step. The range of activities during step 3 can vary widely depending on council practice and individual management needs, in some cases encompassing years of iterative drafting, public hearings, public comment, and multiple options papers and white papers; in other cases consisting of a single staff-level draft.

[8] The term HQS refers to Headquarters staff who will be expected to review and/or clear an action. Specifically, HQS include the NOAA Office of Strategic Planning, Program Planning and Integration (PPI/OSP); the NOAA Office of the General Counsel (GC); the NMFS Assistant Administrator for Fisheries (AA) and Offices of Sustainable Fisheries (OSF), Habitat Conservation (HC), and Protected Resources (PR); the Office of Law Enforcement (OLE); and the Department of Commerce Office of General Counsel (DOC OGC).

[9] The Action Plan needs to be in writing and include an Advisory Statement from the RA. The Action Plan must describe the problem to be addressed and the objective to be met, indicate what type of NEPA analysis will initially be undertaken, include an estimated timeline to implementation taking into account the possible need to reconcile differences and all relevant timing requirements (e.g., APA), describe an initial reasonable range of alternatives, provide an estimate of staff resource requirements (if practicable), identify the participants assigned to the FMAT, and include a checklist of other applicable laws indicating which are likely to raise issues that will need to be addressed, [and, if possible, an initial plan for ensuring they are addressed]. The other applicable laws that are most likely to be implicated include the following: MSA, ESA, MMPA, EFH, RFA, APA, Executive Orders 12866 and 13272 (Economic Impacts), Executive Order 13132 (Federalism), PRA, CZMA, and the DQA. Some fishery management actions may also implicate additional laws, such as Indian Treaty Rights. The laws applicable to a particular fishery management action must be identified on a case-by-case basis. The Advisory Statement from the RA indicates that GC has found the process set forth to be legally sufficient and that the RA agrees to the commitments of agency staff and resources that appear to be necessary for the development of the action.

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
4 CFP	Identification of preferred alternative/ Adoption of draft analysis	All: • FMAT (includes Council, GC, and Regional Staff as appropriate) • Consultation with HQS • Council (approves) EIS: • RA (concurrence)	All: • CEQ Regulations • NAO 216-6 • National Standards Guidelines (63 FR 24212, May 1, 1998) • Social science guidelines • Guidelines for Economic Analysis of Fishery Management Actions (65 FR 65841, Nov. 2, 2000) • EFH Final Rule (67 FR 2343, Jan. 17, 2002) • EFH Consultation Guidance • ESA Consultation Handbook • ESA regulations, 50 CFR 402.01 et seq. • NMFS Sec. 515 Pre-dissemination review guidelines, May 5, 2003 • NOAA Information Quality Guidelines, Oct. 1, 2002	All: • Advisory Statement[10] must be available to Council prior to decision. *This means that all other documents listed in the documents column must be available with sufficient lead time to allow review, and clearances if necessary.	All: • Advisory Statement • Preliminary Draft NEPA document (preliminary DEIS, EA or CE) • DFMP or Draft reg. amendment to the extent practicable • PREE • Draft RIR • Draft regulatory text (to the extent practicable or necessary) • Science Center certification as applicable • ESA Technical Assistance, informal consultation if appropriate • Draft Social Impact Assessment • DQA Predissemination review form signed at regional level	At the end of Step 4, the Council has identified a preferred alternative that is covered by the NEPA Analysis. If there are no ESA/EFH duties, proceed to step 5 and publish the DEIS, or to step 7 if appropriate. *If the preferred alternative is subject to ESA formal consultation requirements or EFH consultation requirements, initiate such consultation and proceed to step 4(a).* *EA/CE: For EAs/CEs, this step may occur simultaneously with Council recommendation of agency action (at step 7) if appropriate.
(a)	ESA/EFH consultations on preferred alternative	All: • Regional Staff • Consultation with HQS • FWS (if appropriate)[11]	• EFH Final Rule (67 FR 2343, Jan. 17, 2002) • EFH Consultation Guidance • ESA Consultation Handbook • ESA regulations, 50 CFR 402.01 et seq.	*Note that receipt of EFH Conservation Recommendations triggers a 30 day period within which a written response must be submitted. In some instances, an "interim response" will be necessary. *Formal ESA Consultation must be completed within 90 days of initiation unless extended by mutual agreement.	• Completed Consultation phase of formal ESA § 7 consultation and documentation thereof with "Consultation Assessment"[12] • Completed EFH assessment, and Conservation Recommendations if appropriate • Response to EFH Conservation Recommendations, or Interim Response, if appropriate	

[10] "Advisory Statements" are in the form of a letter to the Council indicating that the relevant documentation and process are adequate and complete for that step and that all necessary reviewers have been consulted. Because an Advisory Statement requires a determination of legal sufficiency, issues preventing the determination of legal sufficiency also prevent issuance of the Advisory Statement.

[11] FWS may not agree to operate according to our OGs, but we can request – especially if we contacted early via FMAT.

[12] The "Consultation Assessment" is a formal, written memorandum from the appropriate decision-maker in PR (either the RA or the PR ARA) to the SF ARA. It contains a summary of the analysis, information, and conclusions of a formal consultation that would form the basis for the Biological Opinion. Those determinations would be provided in the subsequent Biological Opinion. Under the model in these OGs, the Consultation Assessment would be produced at step 4(a) to document the results of the consultation on the preferred alternative.

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
(b)	Revise analysis as necessary based on consultations	All: • FMAT (includes Council, GC, and Regional Staff as appropriate) • Consultation with HQS	All: • CEQ Regulations • NAO 216-6 • National Standards Guidelines (63 FR 24212, May 1, 1998) • Social science guidelines • Guidelines for Economic Analysis of Fishery Management Actions (65 FR 65841, Nov. 2, 2000)			If, based on the Consultation Assessment, it appears that modifications to the preferred alternative will be necessary (RPAs likely), the revised analysis must include alternatives that incorporate such modifications. It is critical that NMFS and the Council work collaboratively in developing alternatives that will avoid a jeopardy opinion and avoid the need for repeated cycles of the consultation process.
(c) CFP	Revote on preferred alternative as necessary	All: • FMAT (includes Council, GC, and Regional Staff as appropriate) • Consultation with HQS • Council (approves) EIS: • RA (concurrence)	All: • CEQ Regulations • NAO 216-6 • National Standards Guidelines (63 FR 24212, May 1, 1998) • Social science guidelines • Guidelines for Economic Analysis of Fishery Management Actions (65 FR 65841, Nov. 2, 2000) • EFH Final Rule (67 FR 2343, Jan. 17, 2002) • EFH Consultation Guidance • ESA Consultation Handbook • ESA regulations, 50 CFR 402.01 et seq. • NMFS Sec. 515 Pre-dissemination review guidelines, May 5, 2003 • NOAA Information Quality Guidelines, Oct. 1, 2002	All: • Advisory Statement, must be available to Council prior to decision *This means that draft documents must be available with sufficient lead time to allow review, and clearances if necessary. *Note that receipt of EFH Conservation Recommendations triggers a 30 day period within which a written -response must be submitted. In some instances, an "interim response" will be necessary.	All: • Advisory Statement • Draft NEPA document (DEIS, EA or CE) • DFMP or Draft reg. amendment to the extent practicable • PREE • Draft RIR • ESA Consultation Assessment (produced at step 4(a)) • Draft regulatory text (to the extent practicable or necessary) • Science Center certification as applicable • EFH assessment and Conservation Recommendations (produced at step 4(a)) • Response to EFH Conservation Recommendations, or Interim Response, if appropriate • DQA Predissemination review form signed at regional level	All: For NEPA purposes, draft NEPA document should include for public review the information contained in the Consultation Assessment. EA: After final selection of preferred alternative, SF should request PR to initiate drafting of Draft B.O. (DBO) on preferred alternative. Drafting should be complete within 45 days
5	File DEIS w/EPA EA/CE: n/a	EIS: • RA, RO Staff • OSF (transport document to EPA) • PPI • F	EIS: • EPA filing standards • NAO 216-6 • Examples Package • CEQ Regulations	EIS: • 45-day minimum comment period begins • File with EPA by 3:30 Friday, the week prior to publishing • At least 90 days must pass after publication of DEIS before agency can take final action • PR drafts DBO within 45 days of filing DEIS with EPA	EIS: • Memo from F to NOAA PPI/OSP • Memo from NOAA PPI/OSP to EPA • "To All Interested Parties" Memo • EPA publishes NOA on DEIS in FR	

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
6	Public Comment on DEIS	EIS: FMAT and/or Council Staff EPA	EIS: • CEQ Regulations • NAO 216-6 • EPA Guidance	EIS: • Comment period on DEIS must be at least 45 days	EIS: • Public Hearings/Meetings/Written Comments • FR notices advising public of meetings	EIS: If EPA rates the DEIS at a "3" (inadequate), then a new DEIS must be prepared and circulated for public comment.
	EA/CE: Optional	EA/CE, if opted: FMAT and/or Council Staff	EA/CE, if opted: • CEQ Regulations • NAO 216-6	EA/CE, if opted: n/a	EA/CE, if opted: • Public Hearings/Meetings/Written Comments • FR notices advising public of meetings	
Phase III: Council Final Action						
7 CFP	Council Adoption of FMP or Reg. amendment	All: • Council/Staff • RA, RO Staff • HQS (consult as appropriate) • Public Comment at meeting	All: • CEQ Regulations • NAO 216-6 • National Standards Guidelines • Social science guidelines • Guidelines for Economic Analysis of Fishery Management Actions (65 FR 65841, Nov. 2, 2000) • EFH Final Rule (67 FR 2343, Jan. 17, 2002) • EFH Consultation Guidance • ESA Consultation Handbook • ESA regulations, 50 CFR 402.01 et seq. • NMFS Sec. 515 Pre-dissemination review guidelines, May 5, 2003 • NOAA Information Quality Guidelines, Oct. 1, 2002	All: • Advisory Statement, must be available to Council prior to adoption. *This means that all other documents listed in the documents column must be available with sufficient lead time to allow review, and clearances if necessary.	EIS or EA: • Advisory Statement • Preliminary Final NEPA document (either preliminary final EIS or draft EA) with summary of comments and responses thereto • PREE • Draft RIR • Consultation Assessment if preferred alternative subject to ESA section 7 (or DBO if available) • Draft regulatory text (to the extent practicable or necessary) • Final Responses to EFH Conservation Recommendations if not already provided • Social Impact Assessment CE: • All of the above except with a CE memo signed by RA with cc to OSP rather than DEIS or EA	All: "Adequacy and completeness" must be judged based on a case-by-case basis. In some cases, "completeness" may require preparation of draft regulatory text. If inadequacies are identified, including issues that prevent the determination of legal sufficiency, action must stop until corrected, and issues must be elevated for resolution. EIS: Note that for EIS- based actions subject to ESA section formal consultation, a DBO will probably be available since it is produced during the 45 day comment period on the DEIS. EA: Confirm that Draft EA supports FONSI.
8	Council Completion of recommendation package	All: • Council/Staff • RA, RO Staff • GC		All: • Steps 8 and 9 may begin simultaneously *Note that complex requirements may take more time to finalize for submission.	All: • Final FMP or Reg. amendment • Identification of APA issues and/or prepare Proposed Rule • CZMA letters For proposed rules only: • Draft IRFA or Draft RFA certification • Draft RIR	

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
Phase IV: Secretarial Approval						
9 CFP	Completion of Decision Package	All: • Council Staff • RO Staff • GC • HQS (as appropriate) • Regs unit, if possible	All: • CEQ Regulations • NAO 216-6 • National Standards Guidelines (63 FR 24212, May 1, 1998) • Social science guidelines • Guidelines for Economic Analysis of Fishery Management Actions (65 FR 65841, Nov. 2, 2000) • EFH Final Rule (67 FR 2343, Jan. 17, 2002) • ESA Consultation Handbook • ESA regulations, 50 CFR 402.01 et seq. • Document Drafting Handbook, OFR • Preparation of FR Documents • GCF Guidance on EO 12866 compliance (Macpherson memo, 2/10/98) • Examples Package • NMFS Sec. 515 Pre-dissemination review guidelines, May 5, 2003 • NOAA Information Quality Guidelines, Oct. 1, 2002 • PRA Guidance	All: EO 12866: • GCF submits listings to DOC/OMB the first Wednesday of the month • OMB gets 10 days to object to significance determination • 90 days to complete review of significant rules • If subject to ESA consultation, PR has 45 days from submission of request to confirm PBO PRA: • OMB gets 90 days to complete review • CZMA-states get 90 days to respond to consistency determination • As early as possible, draft Proposed Rule should be sent to regs unit CE: • OSP must receive copies of CEs within 3 months	All: • Decision Memo and determinations , determined to be legally sufficient by Regional GC. • Certification of Overfishing Definition, if applicable • Science Center Certifications as applicable • Draft Memo, " F to DOC OGC" [approval] for package • Draft NOAA GC memo • Draft OSF to SBA memo, if applicable • E.O 12866 Submission Form, if applicable • Congressional Review Act (major/not major) • PRA document (SF 83-I) • DQA Predissemination review form signed at regional level Proposed rules only: • IRFA or RFA certification • RIR • SBA transmittal	All: RA must determine that final decision as presented is supported by final analysis and is complete, adequate and consistent with Council decision. If RA determination is negative, action stops until corrective measures are take, e.g., may have to do SDEIS and take more comment. *For actions subject to formal ESA consultation, SF must request PR to review DBO for confirmation as Final BO.
10	Begin MSA Secretarial Review Reg. Am: n/a	FMP: • RA/RO Staff • Councils	FMP: • Examples Package	FMP: • Transmit Date • Begins MSA timelines	FMP: Establish Transmit Date: • Letter establishing transmit date • RA to OSF memo transmitting NOA on FMP	*Note: ROA should establish who sends letter. If council doesn't send, then agency must ensure Council is notified.

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
11	Publication of NOA (FMP), Proposed Rule File FEIS	EIS: HQS, NOAA SP, EPA EA: HQS, NOAA SP CE: HQS Proposed Rule: Regs unit	EIS: • EPA filing Standards • Examples Package EA/CE: • Examples Package Proposed Rule: • Document Drafting Handbook, OFR • Preparation of FR Documents	FMP: • NOA on FMP must publish within 5 Days of Transmittal • Publication of NOA starts 90 day clock (60 days of comment, decision on FMP within 30 days CPE) Proposed Rule: • 15-60 day comment period on PR (30 days recommended) • Final Rule to issue within 30 days CPE on Proposed Rule EIS: • The 30-day cooling off period of FEIS must be completed prior to the AA's decision on the FMP or final rule, whichever comes first.	All: • Fax copy of Federal Register to designated contact in State/Tribal offices EIS: • F to NOAA PPI/OSP memo • NOAA PPI/OSP to EPA memo • "To All Interested Parties" Memo • NOA of FEIS published in FR by EPA • Final BO, if applicable	*Note: Whenever possible, it is encouraged for the comment periods on the FMP and the proposed rule to run concurrently.
12	FMP: RA Decision to approve/ disapprove FMP Reg. Am: RA Decision to approve/ disapprove final rule.	All: • RA, RO Staff • Consult as necessary with HQS	All: Examples Package • NMFS Sec. 515 Pre-dissemination review guidelines, May 5, 2003 • NOAA Information Quality Guidelines, Oct. 1, 2002	FMP: • Final Decision Memo, determined to be legally sufficient by Regional GC, on FMP and NEPA document must be signed by Day 95/30 days after CPE on NOA of FMP Reg. Am: • No final action until CZMA time has tolled • Final Rule due out within 30 days CPE on Proposed Rule	FMP/EIS: • Decision Memo and Determinations, determined to be legally sufficient by Regional GC • NEPA document as approved by RA FMP/EA: • All of the above, and • Final BO, if applicable, and • Draft FONSI Memos (F to PPI/OSP; "To All Interested Parties" memo) Reg. Am/EIS: • Decision Memo and Determinations, determined to be legally sufficient by Regional GC • Final Rule - includes responses to public comments • NEPA document as approved by RA • FRFA or certification • DQA Predissemination review form signed at regional level • Issues Advisory if applicable Reg. Am/EA: • All of the above, and • Final BO, if applicable, and • Draft FONSI Memos (F to PPI/OSP; "To All Interested Parties" memo)	*Note: The RA's approval of the EA/FONSI is not the final determination of FONSI - that authority has not been delegated.

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
13	FMP: AA concurrence on RA Decision to approve/ disapprove FMP. Reg. Am: AA concurrence on RA Decision to approve/ disapprove final rule. EIS/EA: AA sign final NEPA document (ROD or FONSI)	All: HQS	All: CEQ regs and NAO 216-06	All: • Decision Memo, determined to be legally sufficient by Regional GC FMP: • Day 95 or before; No final action until CZMA time has tolled or State concurrence received w/EIS: • At least 90 days after NOA (DEIS) • At least 30 days after NOA (FEIS) w/EA: • FONSI Must be signed by Day-95/30 days after CPE on NOA of FMP w/CE: • Day 95 or before Reg. Am: • No final action until CZMA time has tolled or State concurrence received • Final Rule due out within 30 days CPE on Proposed Rule w/EIS: • At least 90 days after NOA (DEIS) • At least 30 days after NOA (FEIS)	All: • AA signed concurrence EIS: • ROD EA: • PPI/OSP concurrence on FONSI FMP only: • Letter to Council	
14	FMP: RA decision on final rule to implement FMP Reg. Am: n/a	FMP: • RA, RO Staff • Consult as necessary with HQS	FMP: • Examples Package • Document Drafting Handbook, OFR • Preparation of FR Documents • NMFS Sec. 515 Pre-dissemination review guidelines, May 5, 2003 • NOAA Information Quality Guidelines, Oct. 1, 2002	FMP: • Final Rule due out within 30 days close of comment period on Proposed Rule • No final action until CZMA time has tolled	FMP: • Decision Memo and Determinations on final rule, determined to be legally sufficient by Regional GC, to F recommending promulgation of the Final Rule • F to DOC OGC [approval] memo • F to NOAA GC [approval] memo • Final Rule - includes responses to public comments • FRFA/RFA certification • DQA Predissemination review form signed at regional level • Issues Advisory if applicable	FMP: Steps 14 and 15 may be compressed with steps 12 and 13 *If final NEPA document was signed at FMP approval, decision package on Final Rule must also address NEPA to ensure the previous determination is still applicable.

STEP/CFP	DESCRIPTION	WHO	STANDARDS	TIMING ISSUES	DOCUMENTATION	COMMENT
15	AA concurrence on final rule to implement FMP Reg. Am: n/a	FMP: HQS		All: • Decision Memo, determined to be legally sufficient by Regional GC FMP: • No final action until CZMA time has tolled FMP/EIS: • At least 90 days after NOA (DEIS) • At least 30 days after NOA (FEIS)	All: • AA signed concurrence	FMP: Steps 14 and 15 may be compressed with steps 12 and 13 *If final NEPA document was signed at FMP approval, decision package on Final Rule must also address NEPA to ensure the previous determination is still applicable.
16	Publication of Final Rule, or notice of agency decision on FMP, in FR	All: • SF5 • RA/RO and Council Staff as appropriate • OFR	All: • Document Drafting Handbook, OFR • Preparation of FR Document	All (Final rule only): • 30-day delay in effectiveness unless waived under APA • Publish within 30 days CPE on Proposed Rule	All (Final Rule Only): Submit Rule to Congress (Cong. Review Act) • Letters to Congress • Published final rule • Small entity compliance guide	*Note: Coordination with the States is encouraged. Copies of documents may be faxed to designated state contacts. NMFS and Councils may jointly request States to implement complementary measures where appropriate. *FR notice should refer to availability of ROD

TABLE 2: Summary of Steps and Feedback Points in Model Process

Step	Reg. Am w/EA or CE	FMP w/EA or CE	Reg. Am w/EIS	FMP w/EIS
1. Planning	X	X	X	X
2. Initial Draft/Action Plan	*X*	*X*	*X*	*X*
3. Frontloading	X	X	X	X
4. Preferred Alternative; DEIS (a) - (c)			*X*	*X*
*(*If consultations, substeps (a) - (c))*	*(X)*	*(X)*	*(X)*	*(X)*
5. File DEIS			X	X
6. Public Comment on DEIS			X	X
7. Council Vote	*X*	*X*	*X*	*X*
8. Council Staff Clean-up	X	X	X	X
9. Agency Preparations	*X*	*X*	*X*	*X*
10. Transmit		X		X
11. Publish Proposal	X	X	X	X
12. RA – Decision 1	X	X	X	X
13. AA – Decision 1	X	X	X	X
14. RA– Decision 2		X		X
15. AA – Decision 2		X		X
16. Publish final decision	X	X	X	X